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Y-12 NATIONAL SECURITY COMPLEX

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FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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CALENDAR YEAR 2007 GROUNDWATER MONITORING REPORT, U.S. DEPARTMENT OF ENERGY Y-12 NATIONAL SECURITY COMPLEX, OAK RIDGE, TENNESSEE

December 2008

Prepared by

Elvado Environmental LLC
Under Subcontract No. 4300063119

for the

Environmental Compliance Department
Environment, Safety, and Health Division
Y-12 National Security Complex
Oak Ridge, Tennessee 37831

Managed by

Babcock & Wilcox Technical Services Y-12, LLC
for the U.S. Department of Energy
Under Contract No. DE-AC05-00OR22800

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List of Acronyms and Abbreviations

ACO	Analytical Chemistry Organization
BCK	Bear Creek kilometer
BCBG	Bear Creek Burial Grounds
BCV	Bear Creek Valley
Bear Creek Regime	Bear Creek Hydrogeologic Regime
BG	Burial Ground
bgs	below ground surface
BJC	Bechtel Jacobs Company LLC
B&W Y-12	Babcock & Wilcox Technical Services Y-12, LLC
BWXT	BWXT Y-12, L.L.C.
BYBY	Boneyard/Burnyard
CASI	Commodore Advanced Sciences, Inc.
CDL	Construction/Demolition Landfill
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Chestnut Ridge Regime	Chestnut Ridge Hydrogeologic Regime
CRSDB	Chestnut Ridge Sediment Disposal Basin
CRSP	Chestnut Ridge Security Pits
CTET	carbon tetrachloride
CY	calendar year
DFS	Duratek Federal Services
DNAPL	dense nonaqueous phase liquids
DOE	U.S. Department of Energy
DQO	data quality objective
East Fork Regime	Upper East Fork Poplar Creek Hydrogeologic Regime
ECRWP	East Chestnut Ridge Waste Pile
EMWMF	Environmental Management Waste Management Facility
ESS	Environmental Sampling Section
ETB	ethylbenzene
FCAP	Filled Coal Ash Pond
ft	feet
ft/d	feet per day
gpm	gallons per minute
GWPP	Groundwater Protection Program
HCDA	Hazardous Chemical Disposal Area
ILF	Industrial Landfill
KHQ	Kerr Hollow Quarry
MC	methylene chloride
MCL	maximum contaminant level
MDA	minimum detectable activity
mg/d	million gallons per day
µg/L	micrograms per liter
mg/L	milligrams per liter
MMES	Martin Marietta Energy Systems, Inc.
mrem/yr	millirem per year

List of Acronyms and Abbreviations (continued)

msl	mean sea level
NHP	New Hope Pond
NPDES	National Pollution Discharge Elimination System
NT	northern tributary (of Bear Creek)
OF	outfall
OLF	Oil Landfarm
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
PCE	tetrachloroethene
pCi/L	picoCuries per liter
POC	point-of-compliance
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
REDOX	oxidation-reduction potential
ROD	record of decision (CERCLA)
SAP	sampling and analysis plan
SCR	south Chestnut Ridge
SDWA	Safe Drinking Water Act
SS	south side (of Bear Creek)
SWDF	Solid Waste Disposal Facility
Tc-99	technetium-99
TCE	trichloroethene
TCFM	trichlorofluoromethane
TDEC	Tennessee Department of Environment and Conservation
TDS	total dissolved solids
TPU	total propagated uncertainty
U-234	uranium-234
U-238	uranium-238
UEFPC	Upper East Fork Poplar Creek
UST	underground storage tank
VC	vinyl chloride
VOC	volatile organic compound
WCPA	Waste Coolant Processing Area
WMA	waste management area
WRRP	Water Resources Restoration Program
Y-12	Y-12 National Security Complex
yd^3	cubic yards
111TCA	1,1,1-trichloroethane
11DCA	1,1-dichloroethane
11DCE	1,1-dichloroethene
12DCA	1,2-dichloroethane
12DCE	1,2-dichloroethene
12DCP	1,2-dichloropropane
c12DCE	cis-1,2-dichloroethene
t12DCE	trans-1,2-dichloroethene
14DXA	1,4-dioxane

1.0 INTRODUCTION

This report contains the groundwater and surface water monitoring data that were obtained during calendar year (CY) 2007 at the U.S. Department of Energy (DOE) Y-12 National Security Complex (hereafter referenced as Y-12) on the DOE Oak Ridge Reservation (ORR) in Oak Ridge, Tennessee. The CY 2007 monitoring data were obtained from wells, springs, and surface water sampling locations in three hydrogeologic regimes at Y-12 (Figure A.1). The Bear Creek Hydrogeologic Regime (Bear Creek Regime) encompasses a section of Bear Creek Valley (BCV) between the west end of Y-12 and the west end of the Bear Creek Watershed (directions are in reference to the Y-12 grid system). The Upper East Fork Poplar Creek Hydrogeologic Regime (East Fork Regime) encompasses the Y-12 industrial facilities and support structures in BCV. The Chestnut Ridge Hydrogeologic Regime (Chestnut Ridge Regime) encompasses a section of Chestnut Ridge directly south of Y-12. Section 2 of this report provides background information pertinent to groundwater and surface water quality monitoring in each hydrogeologic regime, including the topography and bedrock geology, surface water drainage, groundwater system, and extent of groundwater contamination.

The CY 2007 groundwater and surface water monitoring data in this report were obtained from sampling and analysis activities implemented under the Y-12 Groundwater Protection Program (GWPP) managed by BWXT Y-12, L.L.C. (BWXT), and from sampling and analysis activities implemented under several monitoring programs managed by Bechtel Jacobs Company LLC (BJC). In December 2007, the BWXT corporate name was changed to Babcock & Wilcox Technical Services Y-12, LLC (B&W Y-12), which is applied to personnel and organizations throughout CY 2007 for this report. Cooperative implementation of the monitoring programs directed by the Y-12 GWPP and BJC (i.e., coordinating sample collection and sharing data) ensures that the CY 2007 monitoring results fulfill requirements of all the applicable monitoring drivers with no duplication of sampling and analysis efforts. Section 3 of this report contains a summary of information regarding the groundwater and surface water sampling and analysis activities implemented under the Y-12 GWPP including sampling locations and frequency; quality assurance (QA)/quality control (QC) sampling; sample collection and handling; field measurements and laboratory analytes; data management and data quality objective (DQO) evaluation; and groundwater elevation monitoring. However, this report does not include equivalent information regarding the groundwater and surface water sampling and analysis activities associated with the monitoring programs implemented by BJC. Such details are deferred to the respective programmatic plans and reports issued by BJC (see Section 3.0).

Collectively, the groundwater and surface water monitoring data obtained during CY 2007 by the Y-12 GWPP and BJC address DOE Order 450.1 (*Environmental Protection Program*) requirements for monitoring groundwater and surface water quality in areas: (1) which are, or could be, affected by operations at Y-12 (surveillance monitoring); and (2) where contaminants from Y-12 are most likely to migrate beyond the boundaries of the ORR (exit pathway/perimeter monitoring). Section 4 of this report presents a summary evaluation of the monitoring data with regard to the respective objectives of surveillance monitoring and exit pathway/perimeter monitoring, based on the analytical results for the principal groundwater and surface water contaminants at Y-12: nitrate, uranium, volatile organic compounds (VOCs), gross alpha activity, and gross beta activity. Section 5 of this report summarizes the most pertinent findings regarding the principal contaminants, along with recommendations proposed for ongoing groundwater and surface water quality monitoring performed under the Y-12 GWPP.

Narrative sections of this report reference several appendices. Figures (maps and diagrams) and tables (excluding data summary tables presented in the narrative sections) are in Appendix A and Appendix B, respectively. Appendix C contains construction details for the wells in each regime that were sampled during CY 2007 by either the Y-12 GWPP or BJC. Field measurements recorded during collection of the groundwater and surface water samples and results of laboratory analyses of the samples are in Appendix D (Bear Creek Regime), Appendix E (East Fork Regime and surrounding areas), and Appendix F (Chestnut Ridge Regime). Appendix G contains data for the QA/QC samples associated with monitoring performed in each regime by the Y-12 GWPP.

2.0 BACKGROUND INFORMATION

The following sections provide information relevant to groundwater and surface water quality monitoring in three hydrogeologic regimes at Y-12 (Figure A.1). Included are a short description of the topography and geology in each regime; an overview of the hydrogeologic system in each regime; and a discussion of the extent of groundwater contamination in each regime.

2.1 TOPOGRAPHY AND BEDROCK GEOLOGY

The Bear Creek Regime and the East Fork Regime are each in BCV, which is bound to the north by Pine Ridge and to the south by Chestnut Ridge (Figure A.2). The Bear Creek Regime encompasses several miles of BCV between the western end of the Bear Creek watershed and a low topographic and hydrologic divide near the west end of Y-12. The East Fork Regime encompasses about three miles of BCV east of this topographic/hydrologic divide and west of the ORR property boundary along Scarboro Road. Ground surface elevations along the axis of BCV in each regime range from about 1,000 feet (ft) above mean sea level (msl) near the topographic/hydrologic divide to about 800 ft above msl where Bear Creek cuts through Pine Ridge and about 900 ft above msl where Upper East Fork Poplar Creek (UEFPC) cuts through Pine Ridge.

The Chestnut Ridge Regime is directly south of Y-12 and encompasses a portion of the ridge bordered by BCV to the north, Scarboro Road to the east, Bethel Valley Road to the south, and Dunaway Branch to the west (Figure A.2). The northern flank of the ridge forms a steep slope rising more than 200 ft above the floor of BCV. The crest of the ridge slopes toward the east from an elevation of about 1,200 ft above msl southwest of Y-12 to about 1,060 ft above msl where Scarboro Road crosses the ridge. A series of prominent hills dominates the central part of the broad southern flank of Chestnut Ridge, which gently slopes toward Bethel Valley.

Bedrock geology in the vicinity of Y-12 is characterized by thrust-faulted sequences of southeast-dipping, clastic (primarily shale and siltstone) and carbonate (limestone and dolostone) strata of Lower Cambrian to Upper Ordovician age (Figure A.2). Geologic units in the Bear Creek Regime and the East Fork Regime are the shales and siltstones of the Rome Formation underlying Pine Ridge and the interbedded limestone and shale formations of the Conasauga Group that underlie BCV and the southern flank of Pine Ridge. Carbonates (primarily dolostone) of the Knox Group and the overlying argillaceous limestones and interbedded shales of the Chickamauga Group are the geologic units in the Chestnut Ridge Regime. Strike and dip of bedding in each hydrogeologic regime is generally N55° E and 45° SE, respectively (as referenced to true north).

In BCV, unweathered bedrock is overlain by up to 40 ft of several unconsolidated materials, including alluvium, colluvium, fine-grained residuum, and saprolite (weathered bedrock). Where undisturbed, the saprolite often retains primary textural features of the unweathered bedrock, including fractures (Solomon et al. 1992). However, extensive areas of cut-and-fill within Y-12 have substantially altered the shallow subsurface in BCV throughout much of the East Fork Regime. Most of the fill, which contains many voids and generally consists of 5 to 25 ft of a heterogeneous mixture of building debris and re-compacted soil/residuum (Sutton and Field 1995), was placed in the tributaries and main channel of UEFPC (Figure A.3).

On Chestnut Ridge, bedrock is overlain by as much as 100 ft of red-brown to yellow-orange residuum. The residuum, which is predominantly composed of clay and hematite, contains semicontinuous relict beds of fractured chert and other lithologic heterogeneities (such as silt bodies) that provide a weakly connected network through which saturated flow can occur (Solomon et al. 1992). Also, residuum on Chestnut Ridge is thin or nonexistent near karst features such as dolines (sink holes), swallets (sinking streams), and solution pan features (Ketelle and Huff 1984).

2.2 SURFACE WATER DRAINAGE

The following subsections provide a brief description of surface water drainage systems in the Bear Creek Regime, East Fork Regime, and Chestnut Ridge Regime.

2.2.1 Bear Creek

Surface water in the Bear Creek Regime is drained by Bear Creek and its tributaries (Figure A.2). From its headwaters near the west end of Y-12, Bear Creek flows southwest for approximately 4.5 miles, where it turns northward to flow into East Fork Poplar Creek. Monitoring locations along the main channel of Bear Creek are specified by the Bear Creek kilometer (BCK) value corresponding to the distance upstream from the confluence with East Fork Poplar Creek (e.g., BCK-09.20). Sections of the main channel are referenced as upper Bear Creek (upstream of BCK-11.84), middle Bear Creek (between BCK-11.84 and BCK-09.20), and lower Bear Creek (downstream of BCK-09.20). Tributaries are designated as north tributary (NT) or south tributary along with a value representing the tributary number counted downstream from the headwaters (e.g., NT-1). Major springs along the south side (SS) of Bear Creek are numbered in ascending order downstream from the headwaters (e.g., SS-1).

Approximately half of the annual precipitation in BCV exits via surface water flow in Bear Creek, and possibly higher proportions during winter and early spring, with the remainder of the annual precipitation lost to evapotranspiration and recharge to the groundwater system (DOE 1997a). Flow in the creek increases rapidly during rainfall and afterward reflects the relative contributions of overland flow, stormflow, and groundwater discharge. Flow in the main channel and tributaries generally returns to pre-precipitation levels within one or two days. Major sections of upper and middle Bear Creek are seasonally dry, but flow is perennial in lower Bear Creek.

The main channel of Bear Creek functions as a major conduit of the shallow karst network within the Maynardville Limestone (DOE 1997a). Discharge from springs located along the Maynardville Limestone/Copper Ridge Dolomite boundary on the north slope of Chestnut Ridge dominate the hydrology of the creek, especially during droughts when springs provide most of the flow in the main channel. Additionally, the main channel contains alternating gaining and losing reaches. Each gaining reach generally correlates with a major groundwater discharge area. Losing reaches in upper and middle Bear Creek, particularly a section of the main channel directly south of Sanitary Landfill I, play an important role in transferring contaminants from Bear Creek into the Maynardville Limestone, which directly underlies the creek throughout much of BCV.

2.2.2 Upper East Fork Poplar Creek

Surface water in the East Fork Regime is drained by UEFPC, which was extensively modified during construction of Y-12 (Figure A.3). The East Fork Regime is divided into the three major areas for the purposes of this report: the western Y-12 area between Old Bear Creek Road and grid coordinate easting 55,000; the central Y-12 area between grid coordinate eastings 55,000 and 62,000; and the eastern Y-12 area between grid coordinate easting 62,000 and Scarboro Road. The headwaters and several thousand feet of the main channel in the upper reach of UEFPC, including all its northern tributaries in the western and central Y-12 areas, were filled and replaced with an extensive network of underground storm drains. For reference purposes, each buried tributary of UEFPC is designated with a value (e.g., BT-1) representing the tributary number counted downstream (west to east) from the headwaters. The storm drains direct surface runoff into the exposed portion of the UEFPC channel at several locations. Outfall (OF) 200 is at the beginning of the exposed portion of the UEFPC channel about 6,000 ft upstream of New Hope Pond (NHP)/Lake Reality (Figure A.3). Closed and capped in 1988, NHP was an unlined surface impoundment constructed in 1963 to regulate the quantity and quality of surface water exiting Y-12. Lake Reality is a lined surface impoundment that was built in 1988 to replace NHP.

During normal operations, flow in UEFPC is directed through a concrete-lined distribution channel located around the south and east side of NHP/Lake Reality (Figure A.3). Also, a gravel and perforated pipe underdrain beneath portions of the distribution channel captures shallow groundwater. Until December 1996 when flow was rerouted to bypass Lake Reality, surface flow in the UEFPC distribution channel discharged into Lake Reality (and exited through a weir in the western berm). Beginning in July 1998, flow in the UEFPC distribution channel was diverted through the Lake Reality spillway, which discharges into the mainstream of UEFPC directly north (downstream) of Lake Reality. Bypassing Lake Reality reduces mercury contributions to dry-weather flow in UEFPC.

About 70% of dry-weather flow in UEFPC, is attributable to once-through non-contact cooling water, condensate, and cooling tower blowdown, and the remaining 30% is from groundwater discharge (Shevenell 1994). Beginning in July 1996 a flow management program was implemented whereby water from the Clinch River is discharged near OF 200 to augment flow in UEFPC, which decreased from as much as 15 million gallons per day (mg/d) to about 2.5 mg/d because of reduced operations at Y-12 in recent years. Flow management is needed to achieve the National Pollution Discharge Elimination System (NPDES) minimum daily flow requirement of 7 mg/d at Station 17, which is where UEFPC exits the ORR downstream from Lake Reality (Figure A.3). Flow management also allows compliance with NPDES toxicity requirements and helps lower the elevated water temperature in UEFPC.

2.2.3 Chestnut Ridge

The Chestnut Ridge Regime encompasses five primary tributary drainage basins on south Chestnut Ridge (SCR), informally numbered from west to east (SCR1 through SCR5): Dunaway Branch (SCR1) and SCR2 in the western part of the regime, McCoy Branch (SCR3) in the central part of the regime; and SCR4 and SCR5 in the eastern part of the regime (Figure A.2). These tributaries are mainly intermittent at elevations higher than 900 ft above msl. Each receives flow via surface runoff, stormflow discharge, and groundwater baseflow, which increases with distance downstream and includes substantial contributions from springs. All of the tributaries convey surface flow south toward Bethel Valley and discharge into Melton Hill Lake (Clinch River) south of the Chestnut Ridge Regime.

2.3 GROUNDWATER SYSTEM

The following overview of the groundwater system near Y-12 is based on the conceptual hydrogeologic models described in *Report on the Remedial Investigation of Bear Creek Valley at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee* (DOE 1997a) and *Report on the Remedial Investigation of the Upper East Fork Poplar Creek Characterization Area at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee* (DOE 1998), both of which incorporate the hydrogeologic framework and associated nomenclature described in *Status Report — A Hydrologic Framework for the Oak Ridge Reservation* (Solomon et al. 1992).

There are two basic hydrogeologic units in the vicinity of Y-12: the aquifer and the aquitard (Figure A.2). The aquifer includes the uppermost carbonate formation of the Conasauga Group (Maynardville Limestone) and the overlying formations of the Knox Group. The aquitard, which is not a true aquitard but is so named because it transmits groundwater less effectively than the aquifer, consists of the remaining siliciclastic formations of the Conasauga Group (Nolichucky Shale, Maryville Limestone, Rogersville Shale, Rutledge Limestone, and Pumpkin Valley Shale) and the underlying Rome Formation. The following discussion provides a short description of each hydrogeologic unit.

2.3.1 Aquifer

Components of the aquifer underlie the axis of BCV (Maynardville Limestone) and form Chestnut Ridge (Knox Group). Separate overviews of the hydrologic characteristics of the Maynardville Limestone and the Knox Group are provided below.

2.3.1.1 Maynardville Limestone

Most groundwater flow in the Maynardville Limestone occurs at depths less than 100 ft below ground surface (bgs) in an extensively interconnected network of solution conduits and cavities (karst network). Flow in the shallow karst network is relatively rapid and occurs as “quickflow” discharge to nearby surface drainage features (e.g., Bear Creek). Below the shallow karst network, fractures provide the primary flowpaths. Also, there are seven distinct stratigraphic zones (numbered from bottom to top) in the Maynardville Limestone near Y-12 (Shevenell 1995). Because of vuggy porosity related to dissolution of gypsum nodules, the uppermost stratigraphic zone (Zone 6) is the most permeable and probably transmits the bulk of the groundwater in the Maynardville Limestone (Goldstrand 1995).

Available data indicated fairly homogeneous groundwater geochemistry in the Maynardville Limestone; almost every monitoring well in this formation, regardless of depth, yields calcium-magnesium-bicarbonate groundwater. Some shallow wells monitor sulfate-enriched groundwater, which probably reflects dissolution of locally disseminated secondary minerals, including gypsum, anhydrite, and pyrite. Also, several deep wells monitor calcium-magnesium-sulfate groundwater with very high total dissolved solids (TDS).

Isopleths of groundwater elevations in the Maynardville Limestone show a low hydrologic divide in BCV near the west end of Y-12, with flow along geologic strike to the west-southwest in the Bear Creek Regime (Figure A.4) and along geologic strike to the east-southeast in the East Fork Regime (Figure A.5). In the Bear Creek Regime, groundwater from the deeper flow system in the Maynardville Limestone discharges along major gaining (influent) reaches of Bear Creek. These discharge areas are possibly related to large-scale structural (e.g., cross-strike faults) or stratigraphic discontinuities in the Maynardville Limestone. Also, in the East Fork Regime, shallow flow in the Maynardville Limestone in the eastern Y-12 area is primarily to the east (along geologic strike) toward Union Valley east of the ORR boundary, but the UEFPC distribution channel underdrain apparently functions as a highly permeable groundwater flow path and a constant head (recharge) boundary that strongly influence local flow directions (BJC 1998).

Results of a long-term pumping test and concurrent dye-trace test performed in July 1998 provide the most recent data regarding the hydrologic characteristics of the intermediate and deep groundwater flowpaths in the Maynardville Limestone in the East Fork Regime, and the degree of hydraulic connection between the shallow and deep flow systems in the eastern Y-12 area (BJC 1998). A stepped pump test was performed using a well (GW-845) installed in the Maynardville Limestone about 250 ft southeast of NHP. Groundwater was pumped continuously from the well (which has an open-hole interval from 157 to 438 ft bgs) at progressively increased discharge rates: 25 gallons per minute (gpm) for 24 hours, 50 gpm for 24 hours, and 100 gpm for seven days (pumping started on July 9, 1998 and stopped on July 18, 1998). Water level drawdown and recovery data obtained from nearby monitoring wells indicated: (1) rapid, large responses in wells located along strike to the east and across strike to the north of the pumping well, (2) more moderate responses in wells located oblique to strike near the contact with the Nolichucky Shale to the east of the pumping well, (3) weak responses in upgradient wells in the Maynardville Limestone to the west of the pumping well, and (4) little if any response in wells located adjacent to Lake Reality and the UEFPC distribution channel underdrain to the north and northeast of the pumping well. The maximum observed radius of influence from the pumping well encompassed the entire subcrop of the Maynardville Limestone in the eastern Y-12 area, with particularly strong anisotropies to the east (along strike) and north (up-dip) of the well and low-permeability boundary effects along the contact with the Nolichucky Shale (BJC 1998).

In conjunction with the pumping test, eosine dye was injected in a shallow (60 ft bgs) well (GW-153) located about 450 ft southwest (upgradient) of the pumping well (GW-845). Rapid breakthrough of the dye observed in the pumping well clearly demonstrated the hydraulic connection between the shallow and intermediate/deep groundwater flowpaths along strike in the Maynardville Limestone. Additionally, confirmed detection of the dye in two shallow wells (GW-220 and GW-832) located about 600 ft northeast (across geologic strike) of the injection well (and about 300 ft northwest of the pumping well) suggests that the degree of hydrologic connection with the UEFPC distribution channel underdrain and groundwater movement along dip parallel or conjugate fracture flowpaths in the shallow flow system are strong enough to overcome the hydraulic capture zone created at the 100 gpm pumping rate in the intermediate to deep flow systems (BJC 1998).

Based on the information obtained from the long-term pumping test and associated dye trace, well GW-845 was designated as the groundwater extraction point for the contaminant plume capture system required under an interim action Record of Decision (ROD) for Union Valley (DOE 1997b). Full operation of the system began in October 2000 and has involved pumping well GW-845 at a rate of 25 gpm and treating the groundwater to remove particulates, iron, manganese, and VOCs. Monthly water level measurements in selected observation wells show that continuous operation of the system has generally maintained 15 to 17 ft of drawdown in the immediate vicinity of well GW-845 (Figure A.5) and has established an elongated zone of influence that extends parallel with geologic strike for at least 900 ft to the east (downgradient) and 600 ft to the west (upgradient) of the pumping well (DOE 2002).

2.3.1.2 Knox Group

The Knox Group formations underlying Chestnut Ridge comprise three vertically gradational hydrogeologic subsystems: (1) the stormflow zone, (2) the vadose zone, and (3) the groundwater zone. The subsystems are distinguished by groundwater flux, which decreases with depth (Solomon et al. 1992).

Investigations on Chestnut Ridge in a watershed located approximately 4,000 ft west of the Chestnut Ridge Regime show that groundwater occurs intermittently above the water table in a shallow "stormflow zone" that extends to a depth of about 8 ft bgs (Wilson et al. 1990). Macropores and mesopores provide the primary channels for lateral flow in the stormflow zone, which lasts only a few days (5 - 10) after rainfall. Most groundwater within the stormflow zone is either lost to evapotranspiration or recharge to the water table, and the remaining water discharges at nearby seeps, springs, or streams (Moore 1989).

The vadose zone occurs between the stormflow zone and the water table, which typically occurs near the bedrock/residuum interface. Soil moisture content in the vadose zone is below the saturation limit except in the capillary fringe above the water table and within wetting fronts during periods of vertical percolation from the stormflow zone (Moore 1989). Most recharge through the vadose zone is episodic and occurs along discrete permeable fractures that become saturated, although surrounding micropores remain unsaturated (Solomon et al. 1992). The residuum is hydrologically heterogeneous, with quickflow via dolines to conduits in the subsurface; residuum on Chestnut Ridge near the Oak Ridge National Laboratory (ORNL) has a mean hydraulic conductivity of about 0.006 feet per day (ft/d) (Moore 1988).

Groundwater below the vadose zone occurs within orthogonal sets of permeable, planar fractures that form water-producing zones within an essentially impermeable matrix. Dissolution of bedrock carbonates has enlarged fractures and produced an interconnected conduit-flow system characteristic of karst aquifers. Because the occurrence of solution features and the frequency, aperture, and connectivity of permeable fractures decrease with depth, the bulk hydraulic conductivity of the groundwater zone is vertically gradational. Most groundwater flux occurs within the transitional horizon between residuum and unweathered bedrock (water table interval); lower flux (and longer solute residence times) occurs at successively greater depths in the bedrock (Solomon et al. 1992).

Available data show that hydraulic conductivity in the Knox Group varies over multiple orders of magnitude, which is typical of karst aquifers. Results of straddle packer tests in core holes indicate hydraulic conductivity ranging from 0.0002 to 3.1 ft/d at depths generally less than 600 ft bgs in the lower Knox Group (King and Haase 1988). Hydraulic conductivity values calculated from results of falling-head slug tests performed in monitoring wells completed at shallow depths (60 to 195 ft bgs) in the middle Knox Group range from about 0.003 to 14 ft/d (Jones 1998). Also, results of a preliminary dye-tracer test at the Chestnut Ridge Security Pits (CRSP) indicate flow rates of about 100 to 300 ft/d (Martin Marietta Energy Systems, Inc. [MMES] 1990). Although not confirmed by a second test using different tracers (MMES 1993), these findings are supported by the range of flow rates (490 to 1,250 ft/d) indicated by results of a dye-tracer test performed on Chestnut Ridge near ORNL (Ketelle and Huff 1984).

Groundwater elevations on Chestnut Ridge generally mirror surface topography (Figure A.6). Along the crest of the ridge, which is a recharge area and a flow divide, groundwater generally flows from west to east (parallel to geologic strike), with radial components of flow north into BCV and south toward tributary headwaters on the southern flank of the ridge (across geologic strike). The central part of the regime is characterized by radial flow directions from local groundwater flow divides along hilltops between tributaries. Groundwater flow directions in the southern part of the regime are generally south toward Melton Hill Lake. The overall directions of groundwater flow throughout the Chestnut Ridge

Regime do not significantly change during seasonal groundwater flow conditions. Horizontal hydraulic gradients throughout the year are highest along the steep northern flank of Chestnut Ridge (i.e., across geologic strike) and in the upper reaches of tributaries on the southern ridge flank, and are nearly flat along the southern boundary of the regime.

Groundwater in the Knox Group has fairly homogeneous geochemistry. Most wells yield calcium-magnesium-bicarbonate groundwater with pH of 7.5 to 8.0; TDS above 150 milligrams per liter (mg/L); equal or nearly equal molar concentrations of calcium and magnesium; low proportions (<5%) of chloride, sodium, sulfate, and potassium; and very low (i.e., <1 mg/L) carbonate alkalinity and nitrate (as N) concentrations (hereafter synonymous with "nitrate" concentrations). Some wells yield groundwater with enriched chloride and sulfate concentrations that probably reflect the geochemical influence of locally disseminated evaporates (e.g., gypsum) or sulfides (e.g., pyrite). Additionally, groundwater within low permeability (matrix) intervals in the upper Knox Group (e.g., Mascot Dolomite), as indicated by data for several wells at Kerr Hollow Quarry (KHQ), often exhibits greater proportions of sulfate and potassium and higher trace metal concentrations (e.g., strontium) than typical of the groundwater from low yield intervals within the lower Knox Group formations (e.g., Copper Ridge Dolomite). These geochemical differences potentially reflect corresponding differences between carbonate mineralogies in the upper and lower sections of the Knox Group or the proximity to and types of disseminated secondary minerals (Lockheed Martin Energy Systems, Inc. 1996).

2.3.2 Aquitard

The geologic formations that comprise the aquitard directly underlie the primary contaminant source areas in the Bear Creek Regime and the East Fork Regime and are hydraulically upgradient of the Maynardville Limestone throughout much of BCV. Fractures provide the primary groundwater flowpaths in the aquitard; flow through the rock matrix is negligible but nevertheless plays an important role in contaminant migration because of matrix diffusion processes. Flow directions are primarily parallel to bedding (along geologic strike and dip), which may or may not coincide with the direction of maximum horizontal hydraulic gradient inferred from groundwater elevation isopleths. Most flow occurs within the shallow bedrock interval less than 100 ft bgs. Flow across bedding occurs primarily along permeable zones formed by cross-cutting fractures or fracture zones (and possibly small faults). Some of these cross-cutting structures may act as barriers to lateral flow, causing groundwater from deeper intervals to upwell and discharge to the shallower flow system. Others may serve as preferential pathways for migration of contaminants from the aquitard into the Maynardville Limestone.

Most groundwater flow in the aquitard occurs within a highly permeable interval near the bedrock/residuum interface. West of Y-12 in the Bear Creek Regime, flow in the aquitard above the water table occurs in response to precipitation when flowpaths in the residual soils become saturated and rapidly transmit water laterally (stormflow) down slope toward springs, seeps, streams and vertically (recharge) to the water table interval. In the East Fork Regime, however, infiltration into the subsurface and recharge to the water table interval is strongly influenced by the many buildings and other impervious surfaces that cover much of the regime as well as the extensive areas of fill and networks of subsurface storm drains, sewers, and process lines.

Recharge to the water table interval in the aquitard promotes strike-parallel groundwater flow toward nearby discharge areas, which include the subsurface drainage network in the East Fork Regime and the northern tributaries of Bear Creek in the Bear Creek Regime. Although the presence of contaminants in groundwater more than 200 ft bgs in the Nolichucky Shale clearly indicates permeable flowpaths at depth, flow is most active at depths less than 100 ft bgs, and only a small percentage of total flow ultimately recharges the deeper bedrock, where upward hydraulic gradients predominate. In the Bear Creek Regime, about 94% of the available groundwater in the aquitard discharges to Bear Creek tributaries, about 5% flows along cross-cutting fractures into the aquifer, and about 1% flows through strike-parallel pathways in the deeper subsurface (DOE 1997a).

Decreasing groundwater flux with depth in the aquitard in BCV also is reflected by distinct changes in groundwater geochemistry. Most water table interval and shallow (i.e., <100 ft bgs) bedrock wells monitor calcium-magnesium-bicarbonate groundwater. A fairly abrupt change to sodium-bicarbonate groundwater, which is interpreted to be a function of longer groundwater residence time related to reduced fracture aperture or increased fracture spacing (Solomon et al. 1992), occurs at a depth of about 100 ft bgs. Further reduced groundwater flux is indicated by the transition from sodium-bicarbonate groundwater to sodium-chloride groundwater that usually occurs at a depth of about 400 ft bgs. The transition to the sodium-chloride groundwater is accompanied by a general increase in TDS.

Isopleths of seasonal groundwater surface elevations in the aquitard (water table interval) in the Bear Creek Regime (Figure A.4) and East Fork Regime (Figure A.5) indicate flow to the west-southwest and east-southeasterly, respectively, toward the Maynardville Limestone. In the East Fork Regime, however, the operation of basement dewatering sumps and the network of subsurface storm drains and utilities throughout much of the western and central Y-12 areas (Figure A.3) strongly influences the movement and discharge of shallow groundwater. For instance, operation of sumps to suppress the local water table below the basement floor of Buildings 9204-4, 9201-5, and 9201-4, and possibly 9204-2 strongly influences local groundwater flow and contaminant transport patterns (DOE 1998).

2.4 GROUNDWATER CONTAMINATION

Groundwater quality monitoring data obtained from the extensive network of monitoring wells associated with Y-12 show that the most widespread groundwater contaminants are nitrate, VOCs, uranium isotopes (primarily uranium-234 [U-234] and uranium-238 [U-238]), and technetium-99 (Tc-99). Maps illustrating the generalized extent of nitrate, VOCs, uranium isotopes (as indicated by gross alpha radioactivity), and Tc-99 (as indicated by gross beta radioactivity) are provided on Figures A.7, A.8, A.9, and A.10, respectively. The following sections provide an overview of groundwater contamination in the Bear Creek Regime, East Fork Regime, and Chestnut Ridge Regime.

2.4.1 Bear Creek Regime

The following sections briefly describe the primary sources of groundwater contamination in the Bear Creek Regime (the S-3 Site, the Oil Landfarm (OLF) waste management area [WMA], and the Bear Creek Burial Grounds [BCBG] WMA) and the principal groundwater transport pathway in the regime (the Maynardville Limestone).

2.4.1.1 S-3 Site

Operation of the former S-3 Ponds emplaced a large reservoir of contamination in the aquitard (Nolichucky Shale) consisting of a heterogeneous mix of inorganic, organic, and radioactive constituents. The principal contaminants are nitrate, Tc-99, uranium isotopes, trace metals (e.g., cadmium), and VOCs. Contaminant concentrations in the aquitard nearest the site have probably reached maximum levels, with the center of mass of the plume slowly moving westward. Westward, strike parallel migration of contaminants in the aquitard occurs until encountering a cross-cutting structure that promotes upward discharge into the shallow flow system or cross-strike flow into the Maynardville Limestone (DOE 1997a). Additionally, matrix diffusion and advective transport processes are slowly releasing contaminants (e.g., nitrate) from the deeper reservoir into the more active (shallow) aquitard flow system.

In the aquitard, nitrate from the former S-3 Ponds extends directly south in the water table interval into the upper reach of Bear Creek and along strike in the water table interval and the deeper bedrock for over 3,000 ft to the west. Because it is highly mobile and chemically stable, nitrate delineates the maximum extent of groundwater transport from the S-3 Site and effectively traces the principal migration pathways in the aquitard. Nitrate concentrations within the plume exceed 10,000 mg/L in the deep bedrock directly below the S-3 Site, 1,000 mg/L in the shallow groundwater near the site, and are less than 100 mg/L near the plume boundaries (Figure A.7).

Gross alpha activity and gross beta activity within the S-3 Site contaminant plume exceed 1,000 picoCuries per liter (pCi/L). Although a diverse population of radioisotopes is present in the groundwater closest to the site, elevated gross alpha and gross beta activity in the groundwater probably delineate migration of uranium isotopes (U-234 and U-238) and Tc-99, respectively, since these were the dominant radiological constituents in wastes placed into the former S-3 Ponds. Also, sludge produced by denitrification of the waste water in each pond was left in place after closure of the site. Sludge within the saturated zone may release Tc-99 and uranium isotopes to the shallow groundwater flow system in the aquitard (DOE 1997a). These contaminants then may be transported southward towards Bear Creek and westward through the water table interval toward discharge points in NT-1 (DOE 1997a).

Other components of the S-3 Site contaminant plume are trace metals and VOCs. The distribution of trace metals is less extensive than that of nitrate and radioactivity, but the most mobile metals within the plume (e.g., barium) have been transported beyond the acidic groundwater ($pH < 5$) nearest the site. Acetone and tetrachloroethene (PCE) are the principal VOCs within the plume. Concentrations of PCE exceed 5,000 micrograms per liter (µg/L) in wells adjacent to the site, potentially indicating the presence of dense nonaqueous phase liquids (DNAPL) in the subsurface, but decrease to less than 50 µg/L about 500 ft downgradient of the site. This reflects the limited extent of PCE migration and suggests substantial natural attenuation in the subsurface.

2.4.1.2 Oil Landfarm WMA

The primary sources of groundwater contaminants in the OLF WMA are the Boneyard/Burnyard (BYBY), the Hazardous Chemical Disposal Area (HCDA), the OLF disposal plots, and Sanitary Landfill I. Each of these sites except the BYBY is a known or suspected source of VOCs in the shallow groundwater; the BYBY is a major source of elemental uranium and alpha radioactivity in the Bear Creek Regime.

The Boneyard was used for the disposal of magnesium chips and construction debris (e.g., concrete) in unlined shallow trenches. Filled trenches were covered with topsoil and seeded with grass. The Burnyard consisted of two unlined trenches, each about 300 ft long by 40 ft wide, in which various types of refuse (including pesticide containers, metal shavings, solvents, oils, and laboratory chemicals) were burned. Some residues may have been buried in the Boneyard. Because the BYBY is a primary source of uranium in the groundwater and surface water in BCV (DOE 1997a), this site was prioritized for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedial action, which was performed in three phases. Remedial designs for the site were prepared during Phase I and remedial action field work began with Phase II. Completed in November 2001, Phase II primarily involved construction of an upgradient subsurface drain to hydraulically isolate the buried wastes at the site in order to reduce the flux of contaminants from the site and to dry the site in preparation of the Phase III field work, which began in May 2002. Phase III focused on the excavation, disposal, and consolidation of wastes from the site and the reconstruction of a section of NT-3 that drains the site. Waste removal actions were completed in October 2002 and involved the excavation of about 64,000 cubic yards (yd^3) of waste materials with the highest concentrations of uranium that were in contact with groundwater. These wastes were disposed in the Environmental Management Waste Management Facility (EMWMF). About 17,000 yd^3 of other waste materials that had lower levels of uranium contamination and were not in contact with groundwater also were excavated, consolidated onsite, and covered with a low-permeability recompacted clay cap. Installation of the cap, including seeding/mulching the topsoil cover, was completed in November 2002. Field work to restore the NT-3 stream channel with natural meanders and gradients in order to reduce erosion of the bank and more efficiently transport water and sediment load through the site was completed in May 2003.

The HCDA was constructed on top of the Burnyard in 1975 and was used as an area for releasing compressed gas from cylinders with leaking or damaged valves and for disposal of reactive or explosive laboratory chemicals. The chemicals were handled to induce the expected reaction or explosion, and remaining liquids were discharged into a small unlined surface impoundment. A low permeability cap was constructed over the HCDA during closure of the OLF. In June 2002, a section of the northwest corner of the cap was excavated and removed during Phase III of the CERCLA remedial action at the BYBY. Excavated wastes were replaced with uncontaminated soil and the filled area was graded to drain, mulched, and seeded with grass.

Groundwater contaminants at the OLF are principally VOCs, and a commingled plume containing two distinct suites of VOCs are evident: one to the northeast dominated by 1,1,1-trichloroethane (111TCA), 1,1-dichloroethane (11DCA), and 1,1-dichloroethene (11DCE); and one to the south dominated by PCE, cis-1,2-dichloroethene (c12DCE), trans-1,2-dichloroethene (t12DCE), and trichloroethene (TCE) (MMES 1989). The dissolved VOC plume appears to be restricted to the shallow flow system. Summed VOC concentrations exceed 1,000 µg/L in the northeast part of the plume and 100 µg/L in the southern part of the plume (Figure A.8); maximum concentrations within the plume do not indicate the presence of DNAPL in the subsurface.

Sanitary Landfill I is a probable source of 11DCA, c12DCE, and t12DCE in the shallow groundwater (aquitard and aquifer) downgradient to the south of the site. Maximum VOC concentrations are typically less than 50 µg/L. In the Maynardville Limestone, these constituents have intermingled with the VOC plume (primarily TCE and c12DCE) originating from upgradient sources. Sanitary Landfill I also may be a source of boron in the groundwater at several wells immediately downgradient (west) of the site.

2.4.1.3 Bear Creek Burial Grounds WMA

Groundwater in the aquitard underlying the BCBG WMA is extensively contaminated with VOCs at both shallow (water table) and deep (bedrock) intervals. There are five primary source areas: Burial Ground (BG)-A (North and South), BG-C (East and West), and the Walk-In Pits (Figure A.8). Dissolved VOC plumes in the shallow groundwater at several of these source areas are probably related to widespread occurrence of DNAPL in the subsurface. Contamination in the deeper groundwater flow system reflects density-driven, downward migration of DNAPL.

The disposal trenches comprising BG-A (North and South) received almost two million gallons of waste oils and coolants, and DNAPL has been encountered at 260 ft and 330 ft bgs in monitoring wells downdip of source trenches in BG-A South. Dissolved VOC plumes in the groundwater underlying both areas are dominated by PCE, TCE, and c12DCE. Other common plume constituents are 111TCA, 11DCA, and 1,2-dichloroethane (12DCA). Summed concentrations of these plume constituents exceed 100,000 µg/L. Groundwater in the water table interval transports the plume constituents along strike toward discharge areas in NT-7. Strike-parallel migration also occurs below the water table interval, as reflected by westward (strike-parallel) transport of PCE indicated by data obtained from deeper bedrock wells west of BG-A South.

Separate plumes of dissolved VOCs apparently occur in the shallow groundwater at BG-C East and BG-C West, each plume dominated by c12DCE with lesser amounts of vinyl chloride (VC), both of which are degradation products of PCE. The concentrations of VOCs in each plume are generally less than 500 µg/L. Groundwater containing these VOCs discharges to the NT-8 catchment on the northwest side of the BCBG WMA. Data for both source areas do not clearly indicate the presence of DNAPL in the subsurface (DOE 1997a).

Groundwater near the Walk-In Pits contains a distinct plume of dissolved VOCs dominated by PCE. Concentrations exceed 2,000 µg/L, which is about 1% of the maximum PCE solubility and possibly indicates DNAPL in the subsurface. Contaminants in the shallow groundwater flow system near the Walk-In Pits may not discharge extensively to surface water (DOE 1997a).

Although large quantities of uranium wastes were disposed in the BCBG WMA, few monitoring wells in the area yield radioactive groundwater samples. However, data for soil samples and surface water samples collected from NT-6, NT-7, and NT-8 indicate that uranium isotopes from BG-A South and BG-C East are probable sources of elevated alpha and beta radioactivity (DOE 1997a). Maximum gross alpha and gross beta activities in the samples from these tributaries ranged from about 20 pCi/L to more than 100 pCi/L. The disparity with the groundwater sample data may be an artifact of the monitoring well network (few wells are screened within the shallowest water table interval where radioactive contamination likely occurs), but the relatively low levels of radioactivity in the groundwater also suggest that the bulk of the uranium wastes in BG-A South and BG-C East are not within the saturated zone (DOE 1997a).

Boron is the primary trace metal contaminant in the groundwater at the BCBG WMA. Elevated boron concentrations occur primarily in the shallow groundwater near BG-A South and BG-C (East and West) and probably resulted from disposal of borax wastewater from Y-12. Boron is most likely present in the groundwater as borate [$B(OH)_3$], which is chemically stable and relatively mobile, and is transported toward discharge points in Bear Creek tributaries NT-7 and NT-8.

2.4.1.4 Maynardville Limestone Exit Pathway

Groundwater contaminants in the Maynardville Limestone originate from the S-3 Site (nitrate and Tc-99), the BYBY (uranium isotopes), Sanitary Landfill I (VOCs), the BCBG WMA (VOCs and uranium isotopes), and the Rust Spoil Area (VOCs) or an unidentified source area in the Bear Creek floodplain adjacent to the Rust Spoil Area. These contaminants enter the Maynardville Limestone through direct recharge, hydrologic communication with surface water in Bear Creek, and inflow of shallow groundwater from the aquitard. Relative contributions from the source areas and the geochemical characteristics of the contaminants have produced two primary plumes of contamination in the groundwater: one containing nitrate and radioactivity and another containing VOCs. Both plumes occur in the shallow karst network and the deeper fracture flowpaths and are commingled downgradient of the BYBY.

The nitrate plume (Figure A.7) in the aquifer essentially delineates the maximum extent of contaminant transport from the former S-3 Ponds and effectively traces the principal migration pathways in the Maynardville Limestone. The plume is continuous in the deeper bedrock from south of the S-3 Site for about 10,000 ft along strike to the west, whereas attenuation from more active recharge and groundwater flux has reduced nitrate levels and produced a more discontinuous nitrate plume in the shallow karst network. Nitrate concentrations within the plume exceed 500 mg/L south of the S-3 Site, but rapidly decrease to less than 50 mg/L south of the OLF WMA, and are typically highest in the fracture-dominated groundwater flow system at depths greater than 100 ft bgs.

The distribution of VOCs (Figure A.8) in the Maynardville Limestone reflects the relative contributions of several source areas and commingling during downgradient transport. Plume constituents in the upper part of BCV are TCE, c12DCE, and PCE; probable source areas are Spoil Area I, the S-3 Site, and possibly the Fire Training Facility in the East Fork Regime. The major inputs to the plume occur from the Rust Spoil Area (TCE) or a nearby source in the Bear Creek floodplain, the HCDA (TCE and c12DCE), Sanitary Landfill I (111TCA and 11DCA), and discharge from the Bear Creek tributary (NT-7) that traverses BG-A North and A South (c12DCE and 12DCA). The highest concentrations within the plume (i.e., >300 µg/L) occur in the deeper groundwater south (down dip) of the HCDA. These high concentrations coincide with the downward vertical hydraulic gradients in the Maynardville Limestone in this area and the major losing reach of middle Bear Creek south of Sanitary Landfill I.

Radioactivity in the groundwater in the Maynardville Limestone is primarily from uranium isotopes and Tc-99. The extent of these radionuclides is generally delineated by gross alpha activity (Figure A.9) and gross beta activity (Figure A.10), respectively. The distribution of gross beta activity mirrors that of nitrate, indicating both a common source of nitrate and Tc-99 (the S-3 Site) and migration along common flowpaths. Increased gross alpha activity in the groundwater downstream of the NT-3 catchment reflects inputs of uranium isotopes from former sources in the BYBY. Before their excavation and removal in May 2002 (see Secion. 2.4.1.2), waste materials containing high concentrations of uranium were within the saturated zone during seasonally high groundwater levels. Uranium isotopes that were leached from the wastes were transported with the shallow groundwater that discharges into NT-3 and recharges directly into the Maynardville Limestone. Prior to the removal of the wastes, gross alpha and gross beta activity exceeded 1,000 pCi/L in the shallow groundwater along NT-3 from the northwest corner of the site to the confluence of NT-3 and Bear Creek (Figure A.9 and Figure A.10).

Most trace metal contamination in the Maynardville Limestone occurs in the shallow groundwater near the S-3 Site and the BYBY. Near the S-3 Site, the principal trace metal contaminants are barium, boron, cadmium, copper, lead, mercury, strontium, and uranium. Some of these metals (e.g., cadmium) were entrained in the highly acidic wastes disposed at the site, and others (e.g., barium and strontium) were dissolved from the underlying bedrock. Trace metal contamination is sporadic in the groundwater at the BYBY and the principal contaminants are beryllium, manganese, mercury, nickel, and uranium. Boron and uranium are the most common trace metal contaminants in the aquifer downgradient of the S-3 Site and the BYBY, which indicates that relatively mobile ionic species of both metals are present in the groundwater.

2.4.2 East Fork Regime

Sources of groundwater contamination in the East Fork Regime include hazardous and nonhazardous waste treatment, storage, or disposal sites; bulk product transfer, storage, and use areas; former petroleum-fuel underground storage tanks (USTs) and associated dispensing facilities; industrial process buildings; waste and product spill areas; and the many process pipelines, effluent drains, and utilities associated with the industrial operations at Y-12. Also, operation of the former S-3 Ponds emplaced a large reservoir of contamination in the western Y-12 area. Intermingling of contaminants from multiple source areas has produced an extensive, essentially continuous groundwater contaminant plume of varying composition that extends from the western Y-12 area through the southern part of the central and eastern Y-12 areas and into Union Valley east of the ORR (Figure A.8).

A plume of nitrate contamination originating from the former S-3 Ponds extends vertically in the aquitard at least 150 ft bgs and laterally at least 5,000 ft into the western Y-12 area (Figure A.7). Nitrate concentrations within the plume exceed 10,000 mg/L. The geometry of the nitrate plume indicates two principal migration pathways: (1) relatively rapid migration along fairly short, shallow pathways (<30 ft bgs) that typically terminate in storm drains or other utilities, building sumps, and the buried tributaries and original mainstream of UEFPC; and (2) substantially slower migration along much longer strike-parallel pathways at greater depths in the bedrock toward basement sumps in Buildings 9204-4, 9201-4, and 9201-5 (DOE 1998). The S-2 Site also is a minor source of nitrate.

The low pH groundwater within the contaminant plume originating from the former S-3 Ponds contains a diverse mix of metal ions and/or ion-complexes (beryllium, cadmium, cobalt, manganese, mercury, and nickel) that are usually not mobile (or are more readily attenuated) in less acidic groundwater, as well as metals that are mobile under a wider range of groundwater pH conditions (barium, boron, strontium, and uranium). Some of these metals were entrained in the acidic wastes disposed at the site (e.g., uranium), and others were dissolved from the underlying saprolite and bedrock (e.g., barium and strontium). Concentrations of several trace metals (e.g., barium) within the plume exceed the applicable Safe Drinking Water Act (SDWA) maximum contaminant level (MCL) for drinking water by an order-of-magnitude or more. Similarly elevated concentrations of several other trace metals (including boron, cadmium, cobalt, copper, mercury, and uranium) occur in the groundwater elsewhere in the East Fork Regime, notably the S-2 Site, but available data do not indicate that extensive plumes of metal ions and/or ion-complexes have developed in the groundwater beyond the immediate vicinity of these sites.

Volatile organic compounds are the most pervasive groundwater contaminants in the East Fork Regime (Figure A.8). The principal components of dissolved VOC plumes in the western Y-12 area and the central Y-12 area are PCE, TCE, c12DCE, 11DCE, and VC. Chloroethanes (primarily 111TCA and 11DCA) are also major components of several plumes in the central Y-12 area. In the eastern Y-12 area, dissolved chloromethanes, primarily carbon tetrachloride (CTET), chloroform, and methylene chloride (MC) are primary components of the VOC plume. Additionally, residual plumes of dissolved petroleum hydrocarbons (benzene, toluene, ethylbenzene (ETB), and total xylene) occur in shallow groundwater near former petroleum fuel USTs. In the aquitard, concentrations of individual plume constituents exceed 1,000 µg/L in the shallow groundwater near the Waste Coolant Processing Area (WCPA), Building 9212, and Tank 0134-U and indicate the presence of DNAPL in the subsurface. At shallow depths (<100 ft bgs) in the Maynardville Limestone, a relatively continuous plume of dissolved VOCs begins near the Fire Training Facility in the western Y-12 area, intermingles with VOC plumes from several sources in the central Y-12 area, and extends underneath NHP in the eastern Y-12 area (Figure A.8). The extent of the plume at intermediate (>200 ft bgs) and deep (>400 ft bgs) intervals in the Maynardville Limestone is not well defined in the western and central Y-12 areas because of limited well coverage. However, data from the network of wells in the eastern Y-12 area show that a plume of dissolved chloromethanes (primarily CTET), which is believed to originate from suspected DNAPL in the Maynardville Limestone west of NHP near Building 9720-6, extends vertically more than 400 ft bgs and laterally (parallel with geologic strike) into Union Valley at least 2,000 ft east of the ORR boundary.

Groundwater with radiological contamination occurs primarily in the aquitard east of the former S-3 Ponds, at Tank 0134-U, Buildings 9204-4 and 9201-5, and the Salvage Yard (Figure A.9 and Figure A.10). In the Maynardville Limestone, radiological contamination occurs near the S-2 Site and upgradient of NHP (the Uranium Oxide Vault, wells GW-605 and GW-606, and the former Oil Skimmer Basin). The former S-3 Ponds are the principal source of uranium isotopes (primarily U-234 and U-238) and Tc-99; the migration of Tc-99 generally mirrors that of nitrate from the site. Gross alpha radioactivity levels within the plume exceed the 15 pCi/L MCL and gross beta radioactivity levels within the plume exceed the SDWA screening level (50 pCi/L) for a 4 millirem per year (mrem/yr) dose equivalent (the drinking water MCL for gross beta radioactivity). Relatively limited influx of radiological contamination directly into the aquifer (or extensive dilution) in the East Fork Regime is indicated by the greatly decreased gross alpha, gross beta, and isotopic uranium activity in the groundwater downgradient of known source areas (e.g., S-2 Site and the former Oil Skimmer Basin).

2.4.3 Chestnut Ridge Regime

Groundwater contamination is much less extensive in the Chestnut Ridge Regime and VOCs are the most common groundwater contaminants (Figure A.8). Dissolved VOCs (primarily chloroethanes and chloroethenes) have been detected in the groundwater samples collected from monitoring wells downgradient from the CRSP and Industrial Landfill (ILF) IV. However, a clearly distinct plume of dissolved VOCs is indicated only by the data for wells at the CRSP.

The CRSP are located on the crest of Chestnut Ridge directly south of the central portion of Y-12, and consist of two areas containing a series of east-west oriented trenches that are about 8 to 10 ft wide, 10 to 18 ft deep, and 700 to 800 ft long. Beginning in 1973, the trenches received hazardous wastes until December 1984 and nonhazardous wastes until the site was closed in November 1988. Data obtained from monitoring wells at the site indicate that a narrow, elongated plume of dissolved VOCs extends parallel with geologic strike for at least 2,600 ft downgradient to the east, and perpendicular to geologic strike for at least 500 ft downgradient to the north and south. The primary components of the plume include 111TCA, 11DCA, and 11DCE near the western trench area, and PCE, TCE, and 1,2-dichloroethene (12DCE) isomers near the eastern trench area. The distribution of the dissolved plume constituents relative to the respective source areas and elongation of the plume along the axis of Chestnut Ridge, despite steeper hydraulic gradients toward the ridge flanks, suggest primarily strike-parallel horizontal transport (west to east) in the groundwater (and possibly vapor phase transport). The maximum depth of vertical migration of the VOCs has not been conclusively determined, but is at least 150 ft bgs in the western trench area, 250 ft bgs near the middle of the site, and 270 ft bgs downgradient of the eastern trench area.

Data obtained since the early 1990s show that low concentrations (many are estimated values below analytical reporting limits) of one or more VOCs (primarily 111TCA) are present in the groundwater at two wells hydraulically downgradient of the waste disposal trenches at the CRSP: well GW-796, which is located at ILF V about 400 ft directly south of the site, and well GW-798, which is located at Construction/ Demolition Landfill (CDL) VII about 1,600 ft south-southeast of the site (Figure A.8). Subsequent monitoring results indicate that VOC levels in both wells remain relatively low, with the more recent data showing that PCE concentrations in well GW-798 occasionally exceed the MCL (5 µg/L). The repeated detection of these compounds in the groundwater at both wells probably reflects southward transport from the CRSP because this site is the only known source of VOCs that is hydraulically upgradient of either well.

The ILF IV, which is located on the crest of Chestnut Ridge directly south of the west end of Y-12, has received non-hazardous solid waste since October 1989 and is a suspected source of 111TCA, 11DCA, 11DCE, and boron in the groundwater downgradient of the site. Elevated total boron concentrations occur in a well located downgradient to the east of the site (GW-217), while VOCs have been repeatedly detected in a well located south of the eastern portion of the site (GW-305). These results potentially indicate groundwater transport along permeable flowpaths from the unlined portion (about 150 ft X 150 ft) at the eastern end of ILF IV. Although the source of these contaminants has not been formally confirmed, no other waste management facility is located upgradient of these wells.

Kerr Hollow Quarry is on the broad southern flank of Chestnut Ridge about 1,000 ft north of Bethel Valley Road and served as a source of stone construction material until it filled with water and was abandoned in the late 1940's. From the early 1950s until November 1988, the quarry was used for the disposal of reactive materials from Y-12 and ORNL. Wastes were removed from the quarry between mid-1990 and late 1993 to obtain certified clean-closure status from the Tennessee Department of Environment and Conservation (TDEC), but the site was finally closed with some wastes remaining in place. Low levels (<5 µg/L) of several VOCs, primarily CTET, chloroform, and PCE, occur in the groundwater at monitoring wells located to the south (GW-144) and southeast (GW-142) of KHQ. Each of these VOCs may be present at low concentrations in the groundwater downgradient of the site, possibly as a consequence of wastes being disturbed during attempts to obtain clean closure of the site, but none of the compounds have been detected in the Resource Conservation and Recovery Act (RCRA) wells at the site since 1997.

3.0 CY 2007 MONITORING PROGRAMS

As noted in Section 1.0, the groundwater and surface water monitoring data included in this report were obtained during CY 2007 from implementation of monitoring programs directed by the Y-12 GWPP and BJC. The Y-12 GWPP implemented monitoring needed to specifically meet requirements of DOE Order 450.1 for surveillance monitoring and exit-pathway/perimeter monitoring (hereafter referenced collectively as DOE Order monitoring). Associated groundwater and surface water sampling and analysis activities were performed in accordance with the Y-12 GWPP sampling and analysis plan (SAP) for CY 2007 (BWXT 2006a), as modified by applicable addenda (Table B.1). The following subsections provide details regarding these sampling and analysis activities, including: the respective network of sampling locations in each hydrogeologic regime; QA/QC sampling; groundwater and surface water sampling methods; field measurements and laboratory analytes; data management protocols and DQO evaluation; and groundwater elevation monitoring.

BJC implemented the following monitoring programs at Y-12 during CY 2007: (1) RCRA post-closure detection monitoring and RCRA post-closure corrective action monitoring (collectively referenced as RCRA monitoring); (2) CERCLA monitoring in accordance with an applicable ROD or related decision documents (hereafter referenced as CERCLA ROD monitoring); (3) CERCLA baseline monitoring to evaluate pre-remediation water quality; (4) CERCLA detection monitoring at the EMWMF, an operating facility located in the Bear Creek Regime for CERCLA remediation wastes generated on the ORR; and (5) detection monitoring for several nonhazardous solid waste disposal facilities (SWDFs) located in the Chestnut Ridge Regime (referenced as SWDF detection monitoring). Groundwater and surface water sampling and analysis activities associated with these programs were performed in general accordance with the requirements specified in the ORR Water Resources Restoration Program (WRRP) SAP for fiscal year 2007 (BJC 2006); the environmental monitoring plan for the EMWMF (Duratek Federal Services [DFS] 2003); and a SWDF detection monitoring SAP issued by the subcontractor responsible for the operations of the landfills on Chestnut Ridge (EnergySolutions 2007). The following subsections provide general information regarding the monitoring programs implemented by BJC (e.g., sampling locations), but specific details, such as QA/QC sampling information, are deferred to the applicable SAPs and related technical reports issued by BJC.

Cooperative implementation of the monitoring programs directed by the Y-12 GWPP and BJC (i.e., preparing SAPs, coordinating sample collection, and sharing data) ensures that the CY 2007 monitoring results fulfill requirements of all the applicable monitoring drivers (DOE Order, RCRA, CERCLA, and SWDF) with no duplication of sampling and analysis efforts.

3.1 SAMPLING LOCATIONS AND FREQUENCY

This report contains groundwater and surface water quality monitoring data obtained during CY 2007 from 238 sampling locations at Y-12, including 208 monitoring wells (complete construction details for each well are provided in Appendix C), 10 springs, and 20 surface water stations. The following subsections provide details regarding the sampling locations in each hydrogeologic regime and the corresponding sampling frequency for each applicable well, spring, and surface water station.

3.1.1 Bear Creek Regime

As shown below in Table 1, a total of 67 monitoring wells, three springs, and nine surface water stations in the Bear Creek Regime were sampled during CY 2007 for the purposes of DOE Order monitoring, RCRA monitoring, and CERCLA-related monitoring. Table B.2 identifies the monitoring program applicable to each well, spring, and surface water station; their locations are shown on Figure A.11.

Table 1. CY 2007 sampling locations in the Bear Creek Regime

Monitoring Driver	Monitoring Wells	Springs	Surface Water Stations
DOE Order	40	2*	2
RCRA	6	1	0
CERCLA	21	0	7
Totals:	**67**	**3**	**9**
Note: * = Spring SS-1 was dry, so no sample was collected (see Table B.2)			

Samples were collected either annually or semiannually from most of the monitoring locations during CY 2007. Of the 67 monitoring wells sampled during CY 2007, 31 wells were sampled annually, 23 wells were sampled semiannually, and 13 wells were sampled quarterly (Table B.2). Spring and surface water samples were collected annually (five locations), semiannually (two locations), during three quarters (four locations), and during all four quarters (one location) of CY 2007 (Table B.2).

Thirty-four of the wells that were sampled specifically for DOE Order monitoring during CY 2007 are located near waste management facilities in BCV (Table B.2 and Figure A.11), including the primary sources of groundwater contamination in the regime (S-3 Site, OLF WMA, and BCBG WMA). The remaining six wells are components of two Exit Pathway Pickets in the regime: Picket B (two wells) is located about 2,000 ft west of the Oil Landfarm and Picket C (four wells) is located about 3,000 ft west of the S-3 Site (Figure A.12). The wells in each Exit Pathway Picket are completed at various depths along strike-normal transects of the Maynardville Limestone, which is the primary contaminant migration pathway in the Bear Creek Regime.

The springs that were sampled during CY 2007 specifically for DOE Order exit pathway/perimeter monitoring discharge into Bear Creek (Table B.2 and Figure A.11), and are located southwest (hydraulically downgradient)of the OLF (SS-4) and the BCBG WMA (SS-5). The surface water stations are located near the west end of BCV (BCK-04.55) and in a northern tributary of Bear Creek (NT-01) about 1,500 ft west of the S-3 Site (Figure A.11).

Groundwater samples were collected from six monitoring wells and one spring to meet RCRA post-closure corrective action monitoring requirements in the Bear Creek Regime during CY 2007 (Table B.2). These wells include point-of-compliance (POC) wells located downgradient of the S-3 Site (GW-276), the OLF (GW-008), and the BCBG WMA (GW-046); three plume boundary wells (GW-712, GW-713, and GW-714) at Exit Pathway Picket W (Figure A.11 and Figure A.12). Spring SS-6 also serves as a plume boundary monitoring location (Figure A.11).

Twenty-one monitoring wells and seven surface water stations in the Bear Creek Regime were sampled to meet CERCLA monitoring requirements during CY 2007 (Table B.2 and Figure A.11). Thirteen monitoring wells and five surface water stations were sampled for CERCLA detection monitoring purposes at the EMWMF. Eight monitoring wells were sampled to meet CERCLA ROD monitoring requirements. Two surface water stations located near the BCBG WMA (NT-07, and NT-08) were sampled for CERCLA baseline monitoring purposes (Figure A.11).

3.1.2 East Fork Regime

As shown below in Table 2, a total of 94 monitoring wells, two springs, and six surface water stations in the East Fork Regime (and surrounding areas) were sampled during CY 2007 to meet the requirements of DOE Order monitoring, RCRA monitoring, and CERCLA monitoring. Table B.3 identifies the monitoring program applicable to each well, spring, and surface water station.

Table 2. CY 2007 sampling locations in the East Fork Regime, north of Pine Ridge, and in Union Valley

Monitoring Driver	Monitoring Wells	Springs	Surface Water Stations
DOE Order	72	0	4
RCRA	5	0	0
CERCLA	18	2	2
Totals:	**94 ***	**2**	**6**

Note: * = The total number is less than the sum because separate samples were collected from well GW-722 for DOE Order (September) and CERCLA (February and April) monitoring purposes (see Table B.3).

Most (89 wells and two surface water stations) of the CY 2007 sampling locations lie within the boundaries of the East Fork Regime. Five wells and two springs are located in Union Valley east the ORR boundary at Scarboro Road (Figure A.13), and four surface water stations are located in drainage features along the ORR boundary on the north side of Pine Ridge (Figure A.14). Of the 94 monitoring wells sampled during CY 2007, 51 wells were sampled annually, 38 wells were sampled semiannually, and five wells were sampled during three quarters (Table B.3). The springs and four surface water stations were sampled annually and two surface water stations were sampled semiannually.

Sixty-eight monitoring wells in East Fork Regime, most of which are located within the western and central areas of Y-12 (Figure A.13), were sampled during CY 2007 specifically to meet DOE Order surveillance monitoring requirements (Table B.3). Two of these wells (GW-954 and GW-956), both located within the central Y-12 area, contain BarCad® pump systems that have three (GW-954) or four (GW-956) pumps installed at discrete depth intervals with a polyvinyl chloride riser casing connecting each pump to the surface (Figure A.15).

Five monitoring wells and four surface water locations were sampled to meet DOE Order exit pathway/perimeter monitoring requirements (Table B.3). One of the monitoring wells is located next to UEFPC in the gap through Pine Ridge northeast of Y-12 (Figure A.13). Note that two deeper wells located in the gap through Pine Ridge (GW-207 and GW-208) with a long-term exit pathway monitoring history are no longer monitored because the wells were granted inactive status under the Y-12 GWPP (BWXT 2006b). These wells are not located hydraulically downgradient (along strike) of any confirmed or potential sources of groundwater contamination. The other exit pathway wells are located between UEFPC and Scarboro Road at the east end of Y-12. One well is equipped with a Westbay™ multi-port sampling apparatus (Westbay well GW-722), with sampling ports set at ten discrete depths intervals in the well (Figure A.16). Groundwater samples were collected once (in September 2007) from all of the sampling ports and were collected from five of the sampling ports (ports 14,17, 20, 22, and 33) during

February and April 2007 (Table B.3). The surface water stations are located north of Pine Ridge (Figure A.14), and samples were collected annually from these stations during CY 2007 (Table B.3).

Groundwater samples were collected from five wells to meet RCRA post-closure corrective action monitoring requirements in the East Fork Regime during CY 2007. These wells include one POC well (GW-108) which is located in the western Y-12 area about 800 ft southeast of the S-3 Site, and four plume delineation wells (GW-193, GW-605, GW-606, and GW-733) which are located several thousand ft east-southeast of the S-3 Site (Figure A.13).

Eighteen monitoring wells, two springs, and two surface water stations were sampled during CY 2007 specifically to meet CERCLA monitoring requirements (Table B.3). Thirteen monitoring wells and two springs were sampled for CERCLA ROD monitoring purposes. Eight of these monitoring wells (GW-151, GW-154, GW-223, GW-380, GW-382, GW-722, GW-762, and GW-832) are located in the eastern Y-12 area (Figure A.13). The surface water stations (200A6 and Station 8) are located in the central Y-12 area (Figure A.13). The other five monitoring wells and the springs are located in Union Valley east of the ORR boundary along Scarboro Road (Figure A.13). Sampling locations used for CERCLA baseline monitoring include five monitoring wells located in the western (GW-253 and GW-618) and eastern (GW-281, GW-658, and GW-802) Y-12 areas.

3.1.3 Chestnut Ridge Regime

As shown below in Table 3, a total of 47 monitoring wells, five springs, and five surface water stations in the Chestnut Ridge Regime were sampled during CY 2007 to meet the requirements of DOE Order monitoring, SWDF detection monitoring, RCRA monitoring, and CERCLA monitoring. Table B.4 identifies the monitoring program applicable to each well, spring, and surface water station; their locations are shown on Figure A.17.

Table 3. CY 2007 sampling locations in the Chestnut Ridge Regime

Monitoring Driver	Monitoring Wells	Springs	Surface Water Stations
DOE Order	5	2	3
SWDF	21	1	0
RCRA	17	0	0
CERCLA	4	2	2
Totals:	**47**	**5**	**5**

Groundwater samples were collected semiannually during CY 2007 from most (33 wells) of the monitoring wells. Thirteen wells were sampled once and one well (GW-305) was sampled during each quarter of the year (Table B.4). Samples from the springs and surface water stations were collected annually (five locations) and semiannually (five locations) during CY 2007 (Table B.4).

Wells located near the CRSP (GW-174, GW-176, GW-179, GW-180, and GW-612) were sampled specifically for DOE Order surveillance monitoring purposes during CY 2007. Sampling locations used for DOE Order exit-pathway/perimeter monitoring are in the southwestern portion of the regime (springs SCR2.1SP and SCR2.2SP) and along Bethel Valley Road in main channels of drainage features where surface water exits the Chestnut Ridge Regime (surface water sampling stations SCR1.5SW, SCR3.5SW, and S17).

Twenty-one monitoring wells and one spring were sampled during CY 2007 to meet SWDF detection monitoring requirements (Table B.4). The monitoring wells are located at five SWDFs: three wells at ILF II; five wells at ILF IV; five wells at ILF V; four wells at CDL VI; and four wells at CDL VII (Figure A.17). A spring (SCR4.3SP) was sampled for the purposes of SWDF detection monitoring at ILF V and is located about 2,400 ft southeast of the site (Figure A.17). At the request of the TDEC, samples were collected quarterly from well GW-305 at ILF IV during CY 2007 because the nickel concentration reported for the sample collected in July 1999 exceeded the Groundwater Protection Standard defined in the operating permit for the site (TDEC 1999).

A total of 17 monitoring wells were sampled to meet RCRA monitoring requirements during CY 2007 in the Chestnut Ridge Regime: three wells for RCRA post-closure corrective action monitoring and 14 wells for RCRA post-closure detective monitoring (Table B.4). RCRA post-closure corrective action monitoring at the CRSP included one POC well (GW-177) located at the west end of the site and two plume delineation wells: GW-301 at the former Chestnut Ridge Borrow Area Waste Pile about 3,000 ft east of the site; and GW-831 at the Filled Coal Ash Pond (FCAP) about 2,000 ft southwest of the site (Figure A.17). Note that the SWDF detection monitoring results for five monitoring wells and one spring also serve the purposes of RCRA post-closure corrective action monitoring at the CRSP. The monitoring wells include one background well (GW-521) and four plume delineation wells (GW-557, GW-562, GW-799, and GW-801) (Table B.4 and Figure A.17). The spring sampling location (SCR4.3SP) is located south of CDL VII (Figure A.17). During CY 2007, RCRA post-closure detection monitoring included four wells at the Chestnut Ridge Sediment Disposal Basin (CRSDB), six wells at the East Chestnut Ridge Waste Pile (ECRWP), and four wells at KHQ (Table B.4). The RCRA monitoring well network at the CRSDB includes one well (GW-159) located hydraulically upgradient (northwest) of the site and three POC wells (GW-156, GW-731, and GW-732) to the east-southeast (hydraulically downgradient) of the site (Figure A.17). One upgradient/background well (GW-231) and three downgradient POC wells (GW-143, GW-144, and GW-145) comprise the RCRA monitoring well network at KHQ (Figure A.17). Groundwater monitoring at the ECRWP began in CY 2007 to meet RCRA detection monitoring requirements. To obtain current monitoring data (none of these wells have been sampled in about 10 years), the RCRA monitoring network for CY 2007 included the upgradient/background well (GW-294) and all of the downgradient POC wells (GW-161, GW-292, GW-293, GW-296, and GW-298). Future monitoring events will include the upgradient well and three of the POC wells.

Samples were collected from four monitoring wells, two springs, and two surface water stations for the specific purposes of CERCLA monitoring in the Chestnut Ridge Regime during CY 2007. The wells (located at the United Nuclear Corporation Site) and the surface water stations (in McCoy Branch) were sampled for CERCLA ROD monitoring purposes (Figure A.17 and Table B.4). A spring (SCR3.5SP) located along McCoy Branch and a spring (SCR1.25SP) along Dunaway Branch in the southwestern portion of the regime (Figure A.17) were sampled for CERCLA baseline monitoring purposes (Table B.4).

3.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLING

The following discussion pertains to the QA/QC sampling activities managed by the Y-12 GWPP during CY 2007. Comparable QA/QC sampling protocols also were performed by monitoring programs managed by BJC (BJC 1999 and EnergySolutions 2007).

As shown in Table 4, the QA/QC samples associated with the groundwater and surface water monitoring performed under the Y-12 GWPP during CY 2007 included 95 trip blanks, 58 method (laboratory) blanks, four field blanks, one equipment rinsate sample, and 22 duplicate groundwater and surface water samples.

Table 4. QA/QC samples analyzed in CY 2007 for the Y-12 GWPP

Sample Type	Total Number of Samples per Quarter of CY 2007				Annual Total
	First	Second	Third	Fourth	
Trip Blank Samples	24	30	22	19	**95**
Method Blank Samples	17	17	11	13	**58**
Field Blank Samples	1	1	1	1	**4**
Equipment Rinsate Samples	0	0	1	0	**1**
Duplicate Samples	5	7	5	5	**22**

The blanks and equipment rinsate samples were prepared and analyzed as specified in the *Field Quality Control Samples* operating procedure (BWXT 2007a). Analytical results for the blank samples help assess the environmental conditions in the field and laboratory under which associated groundwater and surface water samples were collected, transported, stored, and analyzed. Trip blanks were samples of deionized water prepared in the laboratory and transported to the field and then to the laboratory in coolers containing groundwater and surface water samples. Field blanks were samples of deionized water that were transported to the field in a sealed glass container and transferred to sample bottles at monitoring wells GW-246 (first and third quarters) and GW-220 (second and fourth quarters) and then transported to the laboratory in a cooler containing the other samples from the well. Method blanks were samples of deionized water that were prepared in the laboratory and analyzed along with one or more associated groundwater or surface water samples. The equipment rinsate was a sample of the deionized water from the final rinse of the decontaminated portable sampling equipment after sampling was completed at Westbay well GW-722 during the third quarter of CY 2007 (Appendix G).

Method blanks, trip blanks, field blanks, and equipment rinsate samples were analyzed for VOCs; equipment rinsates also were analyzed for miscellaneous analytes (e.g., suspended solids), major ions, trace metals, and radioanalytes. Appendix G provides summaries of detected results for the QA/QC blanks and equipment rinsate sample and shows the method blank and trip blank samples associated with each groundwater and surface water sample collected under management of the GWPP during CY 2007.

A total of 22 field duplicate samples were collected during CY 2007 from six wells and one surface water station in the Bear Creek Regime (Table B.2), 12 wells in the East Fork Regime and one surface water station located north of Pine Ridge (Table B.3), one well and one surface water station in the Chestnut Ridge Regime (Table B.4). The duplicate samples were analyzed for the same constituents and parameters specified for the sampling location from which they were collected. Analytical results for the duplicates are presented with the regular sample results in Appendices D, E, and F.

3.3 SAMPLE COLLECTION AND HANDLING

The following discussion pertains to the groundwater and surface water sampling activities managed by the Y-12 GWPP during CY 2007. Personnel with the Y-12 Analytical Chemistry Organization (ACO) were responsible for collection, transportation, and chain-of-custody control of the groundwater and surface water samples during the first and second quarterly sampling events of CY 2007. From May to June 2007, the ACO sampling team trained personnel from the Environmental Sampling Section (ESS) of the Y-12 Environmental Compliance Department, and the ESS assumed responsibility for all Y-12 GWPP sampling activities on July 1, 2007. Sampling throughout the year was performed in accordance with the most recent version of the technical procedures approved by the Y-12 GWPP Manager (BWXT 2002a and BWXT 2007b). All samples were collected in appropriate containers, preserved as required, labeled, logged, placed in ice-filled coolers, and transported to the designated laboratory in accordance with chain-of-custody control requirements. Similar protocols were followed under the monitoring programs managed by BJC during CY 2007 (Commodore Advanced Sciences, Inc [CASI] 2005a).

Unfiltered samples were collected from the monitoring wells, springs, and surface water stations in each hydrogeologic regime during CY 2007. Groundwater samples were collected from most monitoring wells with dedicated bladder pumps (Well Wizard™). However, samples were obtained from one well equipped with a dedicated Westbay ™ multi-port sampling apparatus (well GW-722) and from two wells equipped with multilevel BarCad® pump systems (wells GW-954 and GW-956).

The low-flow minimal drawdown sampling method was used to obtain groundwater samples from the wells equipped with dedicated bladder pumps. Under this method, a representative sample is obtained from a discrete depth interval without introducing stagnant water from the well casing. To obtain the sample, groundwater is pumped from the well at a flow rate which is low enough (<300 milliliters per minute) to minimize drawdown of the water level in the well (<0.1 ft per quarter-hour). At five-minute intervals after the water-level drawdown has stabilized, field personnel record measurements of the pH, conductivity, water temperature, oxidation-reduction potential (REDOX), and dissolved oxygen. Samples of the groundwater in the well are collected once the field measurements for each parameter show minimal variation over four consecutive readings.

Groundwater samples were collected from Westbay well GW-722 in accordance with the most recent and approved version of the operating procedures for the multi-port sampling equipment (BWXT 2002b and BWXT 2006c). Four 250-milliliter non-vented stainless steel sample collection bottles are used to obtain groundwater samples from the sampling ports. The sample collection bottles are lowered to the designated sampling port, the sampling port valve is opened remotely, and the bottles are allowed to fill with groundwater. The filled bottles are retrieved to the surface and the contents are poured into the appropriate laboratory sample bottle(s). The sample collection bottles are lowered, filled, and retrieved as many times as needed to completely fill the laboratory sample bottles. Groundwater in the first sample collection bottle retrieved from each sampling port is used as a "formation rinse" to obtain field measurements and to condition the sample collection bottle.

Groundwater samples were collected using multilevel BarCad® pump (positive displacement gas drive) systems installed in wells GW-954 and GW-956 in the East Fork Regime. These samples were collected in accordance with written guidance provided by the GWPP incorporating the standard operating procedures provided by the manufacturer (BESST Inc. 2005). The manifold installed at the top of the riser casing for each pump has two fittings: one for gas (nitrogen) pressurization and one for sample collection. A pressure control unit is used by field personnel to regulate the amount of nitrogen gas that displaces groundwater in the riser casing above the BarCad® pump. The displaced groundwater is forced upward through the sample collection tube and discharged at the surface during well purging and sample collection. Releasing the nitrogen pressure permits groundwater to move from the formation and sand pack through the BarCad® unit into the riser casing for subsequent cycles of discharge through the sample collection tube. The system is purged to remove standing water from the riser pipe, to allow fresh formation water to recharge the sand pack interval, and to obtain field measurements. Typical purge rates for BarCad® pump systems are 500-800 milliliters per minute. Field personnel collect groundwater samples from the sample return line after the following conditions are met: (1) at least three purge cycles are performed; (2) the volume of subsequent purge cycles is at least 50% of the initial purge volume; and (3) the total water volume purged exceeds 50% of the sand pack volume.

3.4 FIELD MEASUREMENTS AND LABORATORY ANALYTES

The following discussion pertains to the field measurements and laboratory analytes associated with the CY 2007 groundwater and surface water sampling activities directed by the Y-12 GWPP. Identical or functionally equivalent field measurements and laboratory analyses were performed under the monitoring programs managed by BJC during CY 2007 (BJC 2006, DFS 2003, and EnergySolutions 2007).

Field personnel measured the depth to the static water surface before sampling groundwater in each monitoring well (except wells GW-722, GW-954, and GW-956) and recorded field measurements of pH, temperature, conductivity, dissolved oxygen, and REDOX for each groundwater and surface water sampling location (Table B.5). The depth to the static water level was calculated volumetrically in wells with multilevel BarCad® pumps (GW-954 and GW-956) and was converted from pressure measurements for each sampling port in well GW-722. Additionally, REDOX and dissolved oxygen were not recorded for well GW-722 (not applicable when a well is equipped with a multiport sampling apparatus). Field measurements were obtained in accordance with the most recent and approved technical procedures referenced in the CY 2007 SAP for the Y-12 GWPP (BWXT 2006a). The field measurements recorded for the sampling locations in each regime are presented in Appendices D.1, E.1, and F.1.

All of the CY 2007 groundwater samples and surface water samples were analyzed for: (1) miscellaneous laboratory analytes—turbidity, total suspended solids, and total dissolved solids; (2) major ions and trace metals; (3) VOCs; and (4) gross alpha and gross beta activity (Table B.5). Laboratory analyses of the samples were performed by the Y-12 ACO laboratories in accordance with the analytical methods and procedures listed in Table B.5. Analytical results are presented in Appendix D (Bear Creek Regime), Appendix E (East Fork Regime), and Appendix F (Chestnut Ridge Regime).

3.5 DATA MANAGEMENT AND DQO EVALUATION

The following discussion pertains to the data management protocols associated with the CY 2007 groundwater and surface water sampling activities directed by the Y-12 GWPP. Field measurements and results of specified laboratory analyses performed for the samples collected from each well, spring, and surface water station during CY 2007 were provided to the GWPP in electronic files and hardcopy printouts provided by the ACO. Electronic files and hardcopy printouts of 10% of the monitoring data obtained under the Y-12 GWPP were verified in accordance with the *Y-12 Groundwater Protection Program Data Management Plan* (BWXT 2003a). Appropriate ACO staff and personnel in the B&W Y-12 Information Technology Department worked to resolve any incomplete data transfers, irregular parameter names or reporting units, and discrepancies between electronic and hardcopy versions of the data. All data management functions were performed using Microsoft Access to maintain the GWPP Analytical Data Management System.

Analytical results and field measurements associated with monitoring programs managed by BJC were extracted from the Project Environmental Measurements System (PEMS) or the Oak Ridge Environmental Information System (OREIS) by personnel in the B&W Y-12 Information Technology Department. Selected data were formatted as SAS® files for presentation in this report. The BJC data management process (CASI 2005b) is similar to the process described above for the Y-12 GWPP.

The CY 2007 groundwater and surface water monitoring data presented in this report have been evaluated with respect to the DQO criteria defined in the *Y-12 Groundwater Protection Program Data Management Plan* (BWXT 2003a). Specific DQO criteria apply to analytical results for field measurements, major ions, trace metals, VOCs, radiological analytes (gross alpha, gross beta, and radionuclides), and miscellaneous laboratory analytes (e.g., total suspended solids). Monitoring results that do not meet applicable DQOs are flagged with an "R" or "Q" qualifier and described in the introductory section of the applicable data appendices (Appendix D, Appendix E, and Appendix F). Functionally equivalent DQO criteria were employed for some of the monitoring programs managed by BJC (CASI 2005b). All of the data obtained to meet RCRA and SWDF monitoring requirements have been similarly evaluated, however the remainder of the CERCLA monitoring data have not been evaluated. Therefore, some results obtained during 2007 from BJC that are presented in this report may not meet the GWPP DQOs.

3.6 GROUNDWATER ELEVATION MONITORING

As shown in Table 5, respective networks of selected monitoring wells in the Bear Creek, East Fork, and Chestnut Ridge hydrogeologic regimes were used to monitor representative groundwater elevations during seasonally high flow conditions in CY 2007.

Table 5. Summary of CY 2007 groundwater elevation monitoring in the Bear Creek, East Fork, and Chestnut Ridge regimes

REGIME	DEPTH-TO-WATER MEASUREMENTS		GROUNDWATER ELEVATIONS	
	No. of Wells	Dates	Data	Isopleth Map
Bear Creek	64	April 9-17, 2007	Table B.6	Figure A.4
East Fork	52	April 9-12, 2007	Table B.7	Figure A.5
Chestnut Ridge	77	April 9-16, 2007	Table B.8	Figure A.6

Field personnel with the Sampling Services Section of the Y-12 Environmental Compliance Department measured the depth to the static water surface in each well in accordance with the operating procedure (BWXT 2004).

4.0 CY 2007 MONITORING DATA

The monitoring data obtained in CY 2007 is evaluated to meet the groundwater monitoring and reporting requirements of DOE Order 450.1. Separate discussions of the surveillance monitoring and exit pathway/perimeter monitoring data are provided for each hydrogeologic regime, with each discussion focused on the analytical results for the principal groundwater contaminants at Y-12, as defined by: (1) nitrate concentrations above the MCL for drinking water (10 mg/L); (2) total uranium concentrations above the MCL (0.03 mg/L); (3) individual VOC concentrations exceeding applicable MCLs or summed VOC concentrations exceeding 5 µg/L; (4) gross alpha activity above the MCL (15 pCi/L); and (5) gross beta radioactivity above the SDWA screening level (50 pCi/L) for a 4 mrem/yr dose equivalent (the MCL for gross beta activity).

A more detailed analysis and interpretation of the monitoring data for groundwater and surface water sampling locations is deferred to the *Y-12 Groundwater Protection Program Groundwater Monitoring Data Compendium* (B&W Y-12 2008). For each applicable well, spring, and surface water station, the GWPP compendium provides: a complete sampling history, including sampling methods and distinguishing sampling characteristics; an evaluation of hydrologic data (pre-sampling groundwater elevations and available aquifer test data); a discussion of geochemical characteristics of the groundwater or surface water; and a thorough evaluation of the available sampling results for nitrate, uranium, VOCs, gross alpha activity, and gross beta activity, including data summary tables and trend graphs.

In addition to the data evaluation in the GWPP compendium, the following technical reports issued by BJC provide analysis and interpretation of the CY 2007 monitoring results for the applicable RCRA, CERCLA, and SWDF sampling locations in the Bear Creek Regime, East Fork Regime, and Chestnut Ridge Regime: the *2008 Remediation Effectiveness Report* (DOE 2008), the *Calendar Year 2007 Resource Conservation and Recovery Act Annual Monitoring Report* (BJC 2008), and each semiannual *Groundwater Monitoring Report for the Oak Ridge Reservation Landfills* (BJC 2007a and BJC 2007b).

4.1 SURVEILLANCE MONITORING

Groundwater quality monitoring performed during CY 2007 in areas that are, or could be, affected by Y-12 operations are evaluated to determine if any changes have occurred. Due to the inherent differences in their characteristics, these evaluations are separated by hydrogeologic units (aquitard and aquifer, see Section 2.3) in each regime (Bear Creek, East Fork, and Chestnut Ridge hydrogeologic regimes).

4.1.1 Bear Creek Regime

In CY 2007, groundwater samples were collected from 67 monitoring wells in the Bear Creek Regime (Table B.2). Forty of these wells are completed in the geologic formations comprising the aquitard in BCV (Nolichucky Shale, Maryville Limestone, Rogersville Shale, Pumpkin Valley Shale, and Rome Formation) and 27 wells are completed in the geologic formations that comprise the aquifer in BCV (Copper Ridge Dolomite and Maynardville Limestone).

4.1.1.1 Aquitard Wells

Elevated concentrations of one or more of the principal groundwater contaminants at Y-12 were reported for the groundwater samples collected during CY 2007 from 22 aquitard wells in the Bear Creek Regime (Table B.9). The presence of these contaminants in the groundwater at these wells is attributable to the transport/migration of the mobile components of the groundwater contaminant plumes emplaced during historical operations of the former S-3 Ponds, the OLF WMA, and the BCBG WMA. These sites are closed former hazardous waste disposal units that are presently regulated under a RCRA post-closure permit. Additionally, the types and concentrations of contaminants detected in the groundwater samples collected from these wells during CY 2007 are generally consistent with the overall extent of nitrate (Figure A.7), total uranium, VOCs (Figure A.8), gross alpha activity (Figure A.9), and gross beta activity (Figure A.10) defined by the available data for the existing network of wells completed in the aquitard formations in BCV west of Y-12.

Nitrate and Uranium

As shown in Table 6, elevated concentrations of nitrate (>10 mg/L) and/or total uranium (>0.03 mg/L) were reported for at least one groundwater sample collected during CY 2007 from eight aquitard wells in the Bear Creek Regime, listed below in sequence from closest to farthest from the S-3 Site (from northeast [hydraulically upgradient] to southwest [hydraulically downgradient]), which is the source of the nitrate and uranium in the groundwater from each well.

Table 6. Bear Creek Regime CY 2007: elevated nitrate and uranium concentrations in surveillance monitoring aquitard wells

Well Number	Direction - Distance from S-3 Site (Figure A.7)		Total Depth (ft bgs)	Nitrate (mg/L)		Uranium (mg/L)	
				Jan-May 2007	Jul-Aug 2007	Jan-May 2007	Jul-Aug 2007
GW-615	South	50 ft	245	11,100	NS	1.65	NS
GW-246		50 ft	76	3,130	3,200	0.672	0.463
GW-276	Southeast	200 ft	18.5	19.4	29.6	0.45	0.21
GW-277			77.4	503	NS	0.0748Q	NS
GW-616	Southwest	400 ft	269	258	NS	.	NS
GW-101	West	160 ft	17.5	25.7	NS	<	NS
GW-537		2,500 ft	23.3	462	NS	<	NS
GW-085		3,000 ft	58.8	75.8	52	.	.
MCL				10		0.03	

Note: "." = Not detected; NS = Not sampled; "<" = Less than the MCL;
Q = Inconsistent with other results for the well

These sampling results show that the highest concentrations of nitrate occur in the groundwater from wells located directly south of (geologically down-dip) of the S-3 Site (GW-246 and GW-615), reflecting the density-driven vertical (dip-parallel) migration of the highly mineralized acidic wastes disposed at the site. Elevated nitrate concentrations in the shallow groundwater from well GW-537 (Figure A.7) is believed to reflect upwelling of nitrate-contaminated groundwater from deeper flowpaths toward discharge features along NT-2. The elevated nitrate levels in the groundwater from well GW-085 indicate the continued westward transport in the shallow flow system west of NT-2.

As with nitrate, the CY 2007 sampling results for total uranium show the highest concentrations in the groundwater at depth to the south (geologically down-dip) of the S-3 Site. These results also illustrate the much more limited extent of elevated uranium concentrations in the Nolichucky Shale, which generally occur only in the low-pH groundwater within approximately 500 ft of the S-3 Site.

The CY 2007 sampling results for the wells listed in Table 6 support the respective long-term concentration trends indicated by historical data (Table B.9), with time-series plots of the nitrate and uranium data (excluding analytical results that do not meet applicable DQOs) for these wells generally showing:

- Decreasing concentration trends for wells GW-101, GW-276, GW-277, as illustrated by the nitrate and uranium data for well GW-276 (Figure A.18). The decreasing trends reflect substantially reduced flux of nitrate and uranium in the groundwater following closure of the former S-3 Ponds and installation of a low-permeability cap in 1988. Additionally, the decreasing concentrations may reflect the long-term cumulative effects of various natural attenuation processes.

- Indeterminate trends for nitrate concentrations at wells GW-085, GW-246, GW-537, GW-615, and GW-616, and for uranium concentrations at well GW-246. For example, data for well GW-246 (Figure A.18) show little if any change in the uranium concentrations evident in March 1987 (0.464 mg/L) and August 2007 (0.463 mg/L). Additionally, the long-term stable trend for nitrate concentrations seems unusual in light of the substantially reduced flux after the former S-3 Ponds were closed and capped, and is probably a function of the extensive mass of nitrate and uranium emplaced in the Nolichucky Shale beneath the site and the relatively low-permeability of the hydrostratigraphic zone intercepted by the monitored interval in the well.

- Increasing uranium concentration trend for well GW-615 (Figure A.18). The increasing concentrations of uranium indicated by the data for well GW-615 potentially reflect a long-term increase in the relative vertical flux of uranium down-dip of the site. This increase is somewhat conspicuous in light of the indeterminate trend for nitrate at well GW-615, which is far more mobile in groundwater than uranium.

Volatile Organic Compounds

Groundwater samples collected during CY 2007 from 18 aquitard wells in the Bear Creek Regime contained one or more dissolved VOCs at individual or summed concentrations of 5 µg/L or more (Table B.9). As shown in Table 7, the maximum concentration of ten VOCs reported for groundwater samples collected from these wells exceed the respective drinking water MCLs. The presence of dissolved VOCs in the groundwater at these wells reflects their transport/migration from the contaminant source areas emplaced during historical operations of the former S-3 Ponds (four wells), OLF (two wells), and various waste disposal areas within the BCBG WMA (12 wells).

Table 7. Bear Creek Regime CY 2007: maximum VOC concentrations in surveillance monitoring aquitard wells

Location/ Well Number (Fig. A.8)	Concentration (µg/L)									
	PCE	**TCE**	**c12DCE**	**11DCE**	**VC**	**111TCA**	**112TCA**	**12DCA**	**MC**	**Ben-zene**
S-3 Site										
GW-246	120	<	<	<	.	.	.	.	16	<
GW-276	5	.	.	.	.	.	.	.	.	.
GW-277	15	.	.	.	.	.	.	.	<	.
GW-615	.	.	.	.	.	.	.	.	6	.
OLF										
GW-008	73	11	<	<	.	.	.	.	.	.
GW-098	.	6	<	<	.	.	.	.	.	.
BGBG										
GW-014	40	240	1,400	89	230	.	.	<	.	<
GW-046	420	730	2,500	46	240	<	.	<	.	9
GW-071	1,300	170	<	170	9	1,700	.	.	.	2,200
GW-072	.	.	<	<	.	.	.	.	.	.
GW-082*	<	.	670	.	140	.	.	.	.	<
GW-089	.	.	.	.	.	.	.	.	.	.
GW-257	240	.	.	.	.	.	.	.	.	.
GW-289	980	19	<	.	.	.	.	.	.	.
GW-626	630	480	6,600	85	1,400	<	<	21	.	170
GW-627	1,100	370	<	38	43	.	.	.	.	.
GW-629	17,000	4,500	<	320	32	<	6	<	.	7
GW-653*	5	3	<	.	.	.	.	.	.	.
MCL	5	5	70	7	2	200	5	5	5	5

Note: "." = Not detected; "<" = Less than MCL; * = 1,4-dioxane (GW-082=43 µg/L; GW-653=not detected)

As shown in the preceding data summary, extremely high concentrations of VOCs, especially PCE, were detected in the groundwater samples collected from well GW-629. These results confirm the VOC concentrations reported in June 2006 that are several orders-of-magnitude higher than indicated by historical data for the well. The sharp concentration increase potentially indicates further migration/transport of dissolved VOCs at depth (>300 ft bgs) in the Nolichucky Shale directly south (down-dip) of BG-A South (Figure A.8). The concentration of PCE in the June 2006 sample (17,000 µg/L) suggests that DNAPL may have migrated into the subsurface near the well at some time after July 1998, when a sample collected from the well contained no PCE and only a trace of TCE (4 µg/L).

Wells GW-082 and GW-653 were selected to be part of an effort by the Y-12 GWPP to evaluate the occurrence in groundwater of 1,4-dioxane (14DXA), a highly mobile VOC commonly used as a chemical stabilizer in commercial 111TCA preparations. Although 111TCA is not detected in groundwater at either well, the sample collected in February 2007 from well GW-082 had moderate concentrations of the 111TCA degradation products 11DCA (28 µg/L) and chloroethane (33 µg/L), with a slightly higher concentration of 14DXA (43 µg/L). The February 2007 sample from well GW-653 had a trace (3 µg/L) of 11DCA, and 14DXA was not detected.

The CY 2007 sampling results for the wells listed in Table 7 support the long-term VOC concentration trends indicated by respective historical data (Table B.9), with time-series plots of the VOC data (individual compounds and/or summed concentrations of multiple VOCs) for each well, generally showing:

- Decreasing concentration trends for VOCs in groundwater from well GW-276 at the S-3 Site and well GW-014 at the BCBG WMA (Figure A.19). The decreasing concentration trends reflect a combination of several factors, primarily the substantially reduced flux of VOCs following closure of the former S-3 Ponds and BCBG WMA, the components of which were closed in 1986-1988 and covered by low-permeability caps in 1989. Along with reduced flux from the respective source areas, the long-term cumulative effects of various natural attenuation processes, including biologically mediated degradation, also explain the decreasing concentrations of VOCs in the groundwater at these wells.

- Indeterminate concentration trends for VOCs in groundwater from one well near the S-3 Site (GW-615) and five wells located hydraulically downgradient of the BCBG WMA (GW-046, GW-082, GW-257, GW-289,and GW-653). For example, PCE concentrations at well GW-046 (Figure A.19) show wide (seasonal) fluctuations, but similar results were reported for the groundwater samples collected from the well in August 1995 (460 µg/L) and July 2007 (420 µg/L). Essentially unchanged levels of VOCs shown by more than 20 years of sampling data for these wells suggest minimal corresponding change in the relative advective flux of VOCs via the low-permeability flowpaths monitored by each well.

- Increasing concentration trends for VOCs in groundwater from well GW-246 at the S-3 Site, well GW-008 at the OLF WMA, and wells GW-072, GW-626, GW-627, and GW-629 at the BCBG WMA. The increasing concentration trend indicated by the PCE data for well GW-246 (Figure A.19) may be of questionable significance considering the prolonged gap (January 1990 - March 2004) in the sampling history for the well and the relatively low concentrations of PCE (and other VOCs) relative to other contaminants in the groundwater from this well (e.g., nitrate). However, as noted previously, the substantial increase in VOC concentrations indicated by the CY 2006 and CY 2007 sampling results for well GW-629 potentially indicate further down-dip migration of dissolved VOCs in the groundwater and DNAPL in the nearby subsurface. Increasing concentrations of VOCs indicated by the sampling results for wells GW-626 and GW-627, which are located approximately 250 ft directly west of well GW-629 (Figure A.11), potentially reflect a corresponding increase in the relative flux of VOCs via the strike-parallel flowpaths in the Nolichucky Shale west of BG-A South.

- A mixture of decreasing, indeterminate, and increasing concentration trends for individual VOCs in groundwater from wells GW-277 at the S-3 Site, GW-098 at the OLF WMA, and GW-071 at the BCBG WMA. For example, historic data for 12DCE (the primary VOC) at well GW-098 shows increasing concentrations from March 1987 (3 µg/L) to January 1990 (35 µg/L) followed by sharply decreasing concentrations through April 2007 (2 µg/L). However, the TCE concentrations reported for these samples remained fairly constant (6 µg/L, 9 µg/L, and 6 µg/L, respectively). The divergent concentration trends for individual VOCs may reflect differences in the relative mobility of each compound in groundwater, or may indicate differing flowpaths and/or sources.

Gross Alpha and Gross Beta Activity

Groundwater samples collected during CY 2007 from 11 of the aquitard wells used for surveillance monitoring in the Bear Creek Regime contained gross alpha activity and/or gross beta activity above the associated minimum detectable activity (MDA) and the corresponding total propagated uncertainty (TPU). However, as shown in Table 8, elevated levels of gross alpha activity (>15 pCi/L) and/or gross beta activity

(>50 pCi/L) were reported for eight of these wells. Note that the elevated alpha activity reported for wells GW-127 and GW-629 are inconsistent (much higher) with respect to available historical data and do not meet DQOs of the Y-12 GWPP (see Section 3.5). These results (flagged with a "Q" qualifier) are considered likely sampling or analytical artifacts and are excluded from further evaluation.

Table 8. Bear Creek Regime CY 2007: elevated gross alpha activity and gross beta activity in surveillance monitoring aquitard wells

Well	Date Sampled	Gross Alpha Activity (pCi/L)		Gross Beta Activity (pCi/L)	
		MDA	Activity ± TPU	MDA	Activity ± TPU
GW-085	03/22/07	3.3	<MDA	6.9	57 ± 6.8
GW-085	08/15/07	7	<MDA	13	<
GW-127	05/07/07	5	26Q ± 8.5	10	<
GW-246	03/22/07	46	670 ± 110	110	19,000 ± 440
GW-246	08/15/07	110	140 ± 110	240	16,000 ± 580
GW-276	01/03/07	2.65	120 ± 20.6	5.42	151 ± 24.9
GW-276	07/09/07	2.26	109 ± 19.1	4.79	218 ± 35.5
GW-277	05/14/07	22	<MDA	66	580 ± 62
GW-537	05/03/07	12	<MDA	23	330 ± 24
GW-615	05/14/07	190	<MDA	590	630 ± 330
GW-629	01/09/07	3.3	<MDA	8.2	<MDA
GW-629	08/06/07	7.2	18Q ± 10	17	<MDA
Screening Level		15		50	

Note: "<" = Less than or equal to screening level; "Q" = Inconsistent with other results for the well

Elevated levels of gross alpha activity and gross beta activity in the groundwater samples from these wells reflect the transport/migration of uranium isotopes and Tc-99, respectively, from the groundwater contaminants (acidified wastes) emplaced at the source during historical operation of the former S-3 Ponds. As with total uranium, the relatively limited extent of elevated gross alpha activity indicated by the CY 2007 sampling results reflects the limited mobility of uranium isotopes beyond the acidic groundwater in the Nolichucky Shale within approximately 500 ft of the site.

As shown by the CY 2007 sampling results summarized in Table 8, gross beta activity remains extremely high (>10,000 pCi/L) in groundwater from the aquitard (Nolichucky Shale) nearest to the S-3 Site, as indicated by the results for well GW-246. Gross beta activity exceeds 300 pCi/L in the shallow groundwater 2,500 ft west of the site, as indicated by the results for well GW-537. Moreover, as with nitrate, the CY 2007 sampling results for well GW-085 show slightly elevated gross beta activity extending approximately 3,000 ft west of the site (Figure A.10). Historical data show that Tc-99 is the primary beta-emitting radionuclide in the groundwater at each of these wells. Considered a "signature" contaminant from the former S-3 Ponds, Tc-99 is believed to occur as an ion (TcO_4) that, like nitrate, is not readily attenuated in the subsurface and is highly mobile in the groundwater, which largely explains the similar distribution of nitrate and elevated gross beta activity in the aquitard near the site.

The gross alpha and gross beta activity reported for the groundwater samples collected from the above-listed wells during CY 2007 support the long-term trends indicated by historical data for each well (Table B.9).

Time-series plots of the gross alpha and/or gross beta activity reported for each applicable well, excluding results that do not meet applicable DQOs, generally show:

- Decreasing trends for wells GW-276 and GW-277, located southeast of the S-3 Site. The decreasing levels of gross alpha activity and gross beta activity for well GW-276 at the S-3 Site (Figure A.20) mirror the concurrently decreasing trends evident for nitrate and uranium (Figure A.18) and PCE (Figure A.19). As with the other contaminants in the groundwater from this well, the decreasing levels of gross alpha and gross beta activity likewise primarily reflect the substantially reduced flux of uranium isotopes and Tc-99, respectively, that occurred after the former S-3 Ponds were closed and capped.

- Indeterminate gross alpha and/or gross beta activity trends for wells GW-085, GW-246, GW-537, and GW-615, which together essentially characterize the lateral (GW-085) and vertical (GW-615) extent of radiological contamination in the aquitard (Nolichucky Shale) west of the S-3 Site. Of these wells, GW-085 and GW-537 have uninterrupted sampling histories extending back to January/February 1990, with respective data showing a consistent positive correlation between gross beta activity and nitrate concentrations in the groundwater from each well (Figure A.20). Results from these wells reflect the common source of nitrate and Tc-99 (the former S-3 Ponds) and their similar relative mobility in groundwater. Additionally, the data for well GW-085 suggest distinctive, long-term fluctuations in gross beta activity (and nitrate concentrations), showing temporal "pulses" in the level of gross beta activity (and nitrate) in the shallow groundwater from this well.

4.1.1.2 Aquifer Wells

Elevated concentrations of one or more of the principal groundwater contaminants at Y-12 were reported for the groundwater samples collected during CY 2007 from 22 aquifer wells in the Bear Creek Regime (Table B.9). Eight of these wells are components of two Exit Pathway Pickets in the Bear Creek Regime (Figure A.12): Picket B (GW-694, GW-703, GW-704, and GW-706) and Picket C (GW-724, GW-725, GW-738, and GW-740). The remaining wells are located near the eastern end of the regime near the S-3 Site (GW-100, GW-122, and GW-236), Rust Spoil Area (GW-307), and Spoil Area I (GW-313 and GW-315); near Bear Creek south of the OLF WMA (GW-225, GW-226, GW-229, GW-368, GW-369, and GW-601), and near Bear Creek south of the BCBG WMA (GW-052 and GW-053).

The presence of contaminants in the groundwater from these aquifer wells is attributable to the migration of the mobile components of the groundwater contaminant plumes emplaced during historical operations of the former S-3 Ponds, Rust Spoil Area, the OLF WMA, and the BCBG WMA and intermixing during transport in the Maynardville Limestone. The types and concentrations of contaminants detected in the groundwater samples collected from these wells during CY 2007 are generally consistent with the overall extent of nitrate (Figure A.7), total uranium, VOCs (Figure A.8), gross alpha activity (Figure A.9), and gross beta activity (Figure A.10) defined by the available data for the existing network of wells completed in the Maynardville Limestone (and lower Knox Group) in BCV west of Y-12.

Nitrate and Uranium

Elevated concentrations of nitrate (>10 mg/L) and/or total uranium (>0.03 mg/L) were reported for at least one groundwater sample collected during CY 2007 from 15 of the aquifer wells used for surveillance monitoring in the Bear Creek Regime, listed below in Table 9 in sequence from closest to farthest from the S-3 Site.

Table 9. Bear Creek Regime CY 2007: elevated nitrate and uranium concentrations in surveillance monitoring aquifer wells

Well Location / Number		Distance and Direction from S-3 Site (Figure A.7)	Nitrate (mg/L)		Uranium (mg/L)	
			Feb-May 2007	Aug 2007	Feb-May 2007	Aug 2007
S-3 Site	GW-122	375 ft Southwest	252	NS	<	NS
	GW-100	1,150 ft Southwest	35.5	35.8	<	<
	GW-236	1,650 ft Southwest	52.7	NS	<	NS
Exit Pathway Picket C	GW-724	3,000 ft West	NS	16.1	NS	<
	GW-725		NS	13.1	NS	<
	GW-738		NS	19	NS	<
OLF WMA	GW-601	4,500 ft West	19.3	NS	.	NS
	GW-225	4,600 ft West	42.5	40.7	<	<
	GW-226		NS	26.7	NS	<
	GW-229	5,000 ft West	.	NS	0.172	NS
Exit Pathway Picket B	GW-694	7,000 ft West	<	<	0.0383	0.0361
	GW-703		NS	18.2	NS	<
	GW-704		14.6	NS	<	NS
	GW-706		24.2	16.4	0.066	0.061
BCBG	GW-052	8,600 ft West	2.02	NS	0.0456	NS
MCL			10		0.03	
Note: "." = Not detected; "<" = Less than MCL; NS = Not sampled						

These sampling results show that the highest nitrate concentrations in the aquifer (Maynardville Limestone) occur at depth (>100 ft bgs) within approximately 500 ft of the S-3 Site (e.g., GW-122). Also, the nitrate results for well GW-225, which yields groundwater from about 200 ft bgs in the Maynardville Limestone south of the OLF WMA (Figure A.7), are slightly higher than evident in the samples from wells completed at shallower depths in the Maynardville Limestone much closer to the S-3 Site (e.g., GW-100). Higher nitrate levels in the groundwater from well GW-225 reflects the recharge of nitrate contaminated surface water that occurs hydraulically upgradient (east-northeast) of the well along a major reach of Bear Creek that loses substantial flow to the Maynardville Limestone.

As shown in Table 9, elevated concentrations of total uranium were reported only for groundwater samples from wells GW-052, GW-229, GW-694, and GW-706, which are all located hydraulically downgradient (west) of the BYBY, a former waste management facility located within the eastern section of the OLF WMA approximately 1,200 ft east-northeast of well GW-229 (Figure A.9). Uranium-bearing wastes disposed at the BYBY were below the seasonally high water table. Carbonate dissolved from the limestone bedrock combined with uranyl cations leached from the wastes, which greatly increased their otherwise limited mobility in the neutral pH groundwater typical of the Maynardville Limestone (DOE 1997a). The bulk of these wastes were excavated and removed during CERCLA remedial actions completed in May 2003.

Elevated concentrations of nitrate and/or uranium in the groundwater samples collected during CY 2007 from the aquifer wells in the Bear Creek Regime support the long-term concentration trends indicated by respective historical data for each well (Table B.9), with time-series plots of the nitrate and uranium data (excluding analytical results that do not meet DQOs) generally showing:

- Decreasing concentration trends for nitrate at nine wells (GW-100, GW-122, GW-225, GW-236, GW-601, GW-704, GW-706, GW-724, and GW-738), and for uranium at three wells (GW-052, GW-694, and GW-706), as illustrated by nitrate and uranium data for well GW-706 (Figure A.21). Decreasing concentrations of nitrate reflect a combination of substantially reduced flux of nitrate in the Maynardville Limestone after the former S-3 Ponds were closed and capped, and the cumulative effectiveness of various natural attenuation processes, including the flow of nitrate-contaminated groundwater into gaining reaches of Bear Creek.

- Indeterminate concentration trends for nitrate in wells GW-226, GW-703, and GW-725, as illustrated by the nitrate results for wells GW-226 and GW-725 (Figure A.21). These findings suggest minimal overall change in the relative flux of nitrate within the hydrostratigraphic zones intercepted by the monitored interval in each well, which may indicate that these wells yield contaminated groundwater from flow/transport pathways that are not well connected with the most permeable karst network in the Maynardville Limestone.

- An increasing uranium concentration trend in well GW-229 (Figure A.21). Available sampling results for well GW-229 show an order-of-magnitude increase in the concentrations of uranium occurred at some time during the period between sampling events performed in September 1995 (0.014 mg/L) and March 2002 (0.238 mg/L), with subsequent sampling results defining a generally decreasing trend through April 2007 (0.172 mg/L). The decreasing uranium concentrations indicated by the more recent data suggest reduced flux of uranium in response to the removal of uranium-bearing wastes during CERCLA remedial actions at the BYBY.

Volatile Organic Compounds

Groundwater samples collected during CY 2007 from 17 aquifer wells contained individual or summed VOC concentrations of 5 µg/L or more (Table B.9). As shown below in Table 10, the maximum concentrations of PCE, TCE, c12DCE, 11DCE, VC, and benzene reported for at least one groundwater sample from one or more wells exceed the respective drinking water MCLs. Sampling results for these wells also show that TCE is the primary VOC in the intermingled plume of contaminants in groundwater from the Maynardville Limestone west of Y-12, with input to the plume from multiple confirmed sources, including the Rust Spoil Area, the OLF WMA, and the BCBG WMA (Figure A.8).

Table 10. Bear Creek Regime CY 2007: maximum VOC concentrations in surveillance monitoring aquifer wells

Well Number	Concentration (µg/L)					
	PCE	**TCE**	**c12DCE**	**11DCE**	**VC**	**Benzene**
GW-053*	.	<	<	.	.	.
GW-225	<	290	<	<	.	.
GW-226	<	180	<	<	.	.
GW-229	.	7	330	30	25	10
GW-307	.	13	<	.	.	.
GW-313	6	<	.	.	.	.
GW-315	7	<	.	.	.	.
GW-368	.	45	.	.	.	.
GW-369	.	46	.	.	.	.
GW-601	.	85	.	.	.	.
GW-703	.	9	<	.	.	.
GW-704	.	19	<	<	.	.
GW-706	.	10	<	<	<	.
GW-724	<	88	<	.	.	.
GW-725	<	7	<	.	.	.
GW-738	.	16	.	.	.	.
GW-740	.	44	<	.	.	.
MCL	5	5	70	7	2	5

Note: "." = Not detected; "<" = Less than MCL; * = 14DXA results: GW-053=130 µg/L (see Section 4.1.1.1)

The CY 2007 sampling results summarized in Table 10 are consistent with historical data showing the continued persistence of TCE in the groundwater from several of these wells without any concurrent detection of TCE degradation products (e.g., c12DCE) suggest that the geochemical characteristics of the groundwater in these wells are not especially conducive to biologically-mediated degradation processes (reductive dechlorination). Additionally, these VOC results support the long-term concentration trends indicated by respective historical data (Table B.9), with time-series plots of the VOC data (individual compounds and/or summed concentrations of multiple VOCs) for each well, generally showing:

- Variable but generally decreasing concentration trends for VOCs (primarily TCE) in groundwater from wells GW-053, GW-307, GW-315, GW-368, GW-601, GW-703, GW-704, GW-738, and GW-740, as illustrated by TCE data for wells GW-307 and GW-704 (Figure A.22). The decreasing concentration trends reflect a combination of several factors, primarily the substantially reduced flux of VOCs following closure of principal source areas (e.g., OLF WMA) in BCV west of Y-12, along with the long-term cumulative effects of various natural attenuation processes.

- Indeterminate concentration trends for VOCs in groundwater from wells GW-225, GW-226, GW-313, GW-369, GW-706, GW-724, and GW-725, as illustrated by the TCE data for wells GW-225 and GW-706 (Figure A.22). The relatively unchanged levels of VOCs in the groundwater from these wells, all of which have sampling histories extending at least to the early 1990s, suggest minimal corresponding change in the relative advective flux of VOCs via the hydrostratigraphic zone intercepted by the monitored interval in each well.

- A mixture of indeterminate and increasing concentration trends for individual VOCs in groundwater from well GW-229, which is clearly distinguished from the other wells listed in Table 10 by the dominant concentrations of TCE degradation products (12DCE, 11DCE, and VC). Also, the concentrations of these compounds have increased over time, as illustrated by the time-series plot of sampling results for 12DCE and 11DCE (Figure A.22). The increasing concentrations do not show any clear response to the CERCLA remedial actions at the BYBY, which suggests that this site is not a significant source of the VOCs in the groundwater from the well.

Gross Alpha and Gross Beta Activity

Groundwater samples collected during CY 2007 from 21 aquifer wells used for surveillance monitoring in the Bear Creek Regime contained gross alpha activity and/or gross beta activity above the associated MDA and the corresponding TPU (Table B.9). However, as shown in Table 11, elevated gross alpha activity (>15 pCi/L) and/or gross beta activity (>50 pCi/L) were reported only for samples from five of these wells.

Table 11. Bear Creek Regime CY 2007: elevated gross alpha activity and gross beta activity in surveillance monitoring aquifer wells

Well	Date Sampled	Gross Alpha Activity (pCi/L)		Gross Beta Activity (pCi/L)	
		MDA	Activity ± TPU	MDA	Activity ± TPU
GW-052	02/12/07	2.5	26 ± 5.1	6.7	<
GW-229	04/23/07	4.3	79 ± 14	16	61 ± 11
GW-694	08/16/07	4.1	22 ± 5.1	7.3	<
GW-706	03/08/07	2.77	20.5 ± 5.3	4.36	75.2 ± 13
GW-706	08/01/07	3.22	15.4 ± 3.94	5.15	<
GW-738	08/21/07	7.3	<MDA	9.3	65 ± 8.8
Screening Level		15		50	
Note: "<" = Less than or equal to screening level					

Elevated gross alpha and gross beta activity in the groundwater at these wells reflect transport/migration of uranium isotopes and Tc-99, which are the principal radiological components of the intermingled contaminant plume in the Maynardville Limestone.

The CY 2007 monitoring results show that the highest levels of gross alpha activity (GW-229) and gross beta activity (GW-706) occur in the groundwater from aquifer wells located downgradient (west-southwest) of the former BYBY (Figure A.9 and Figure A.10, respectively). These results are consistent with historical data, which show that uranium isotopes are the principal source of gross alpha activity, and beta-emitting decay products of uranium (e.g., thorium-234) and Tc-99 are the principal source of gross beta activity in the groundwater from these wells. Uranium bearing wastes removed from the former BYBY are considered the principal source of the uranium isotopes in the groundwater from each of these wells. Historic data shows that Tc-99, which is a "signature" contaminant from the former S-3 Ponds, accounts for the gross beta activity at well GW-738, contributes to the gross beta activity at well GW-706, and has not been detected at well GW-229.

The elevated gross alpha and gross beta activity reported for the groundwater samples collected from the aquifer wells during CY 2007 support the long-term trends indicated by respective historical data (Table B.9).

Time-series plots of the gross alpha and/or gross beta activity reported for each applicable well, generally show:

- Overall decreasing gross alpha activity trends for wells GW-052 and GW-694 (Figure A.23). The long-term concentration trends for both wells do not exhibit any clear response to the CERCLA remedial actions at the BYBY, completed in May 2003.

- Indeterminate trends for gross beta activity at well GW-738 and for gross alpha and gross beta activity trends for well GW-706 (Figure A.23). These long-term concentration trends do not exhibit any clear response to the CERCLA remedial actions at the BYBY, and suggest minimal relative change in the overall flux of uranium isotopes (and Tc-99) via the groundwater flow/transport pathways intercepted by the monitored interval in the well.

- Increasing trends for gross alpha and gross beta activity in groundwater from well GW-229 (Figure A.23), compared to much lower levels indicated by limited historical radiological results for the well. Also, these trends are similar to the long-term trend for total uranium (Figure A.21) and likewise show decreasing levels of gross alpha and gross beta activity between February 2003 (150 pCi/L and 120 pCi/L, respectively) and April 2007 (79 pCi/L and 61 pCi/L, respectively). Decreasing levels of gross alpha activity and gross beta activity indicated by the recent sampling results suggest a corresponding reduction in the relative flux of uranium isotopes following removal of uranium-bearing wastes from the BYBY during CERCLA remedial actions completed in May 2003.

4.1.2 East Fork Regime

In CY 2007, groundwater samples were collected from 84 monitoring wells in the East Fork Regime (Table B.3). Fifty-four of the wells are completed in the geologic formations comprising the aquitard (Nolichucky Shale, Maryville Limestone, Rogersville Shale, Pumpkin Valley Shale, and Rome Formation). The remaining 30 wells are completed in the geologic formations comprising the aquifer (Copper Ridge Dolomite and Maynardville Limestone).

4.1.2.1 Aquitard Wells

Elevated concentrations of one or more of the principal groundwater contaminants at Y-12 were reported for the groundwater samples collected during CY 2007 from 40 aquitard monitoring wells in the East Fork Regime (Table B.10). The presence of these contaminants in the groundwater from these wells is attributable to the transport/migration of the mobile components of the groundwater contaminant plumes originating from multiple sources, including the S-3 Site (former S-3 Ponds), the S-2 Site, and the WCPA in the western Y-12 area and unidentified sources in the central and eastern Y-12 areas. Additionally, the types and concentrations of contaminants detected in the groundwater samples collected from these wells are generally consistent with the overall extent of nitrate (Figure A.7), total uranium, VOCs (Figure A.8), gross alpha activity (Figure A.9), and gross beta activity (Figure A.10) defined by available data for the existing network of wells completed in the aquitard formations in the western, central, and eastern Y-12 areas.

Nitrate and Uranium

Elevated concentrations of nitrate (>10 mg/L) or uranium (>0.03 mg/L) were detected in groundwater samples collected during CY 2007 from 12 wells in the East Fork Regime. As shown in Table 12, elevated nitrate concentrations were reported for eight aquitard wells in the western Y-12 area and three wells in the central Y-12 area, listed below in sequence from closest to farthest from the S-3 Site, which is the source of nitrate in the groundwater from these wells. Elevated levels of nitrate in the groundwater from these wells reflect the substantial transport of nitrate (and other similarly mobile contaminants) eastward from the former S-3 Ponds, the operation of which created a local mound in the water table that enabled migration of contaminants to the east of the hydrologic divide that now separates the UEFPC and Bear Creek watersheds. These sampling results show that nitrate concentrations remain highest in the groundwater within approximately 1,500 ft of the S-3 Site, and illustrate the preferred strike- and dip-parallel groundwater flow/transport in the water table interval (wells 55-2A, 55-2B, GW-105, GW-106, GW-272, and GW-274), shallow bedrock (<70 ft bgs) interval (wells 55-2C, GW-108, GW-270, and GW-275), and intermediate bedrock interval (GW-109) in the Nolichucky Shale east and southeast of the site.

Table 12. East Fork Regime CY 2007: elevated nitrate and uranium concentrations in surveillance monitoring aquitard wells

Well Location/Number/ Approx. Distance (ft) and Direction from S-3 Ponds (Figure A.7)			Nitrate (mg/L)		Uranium (mg/L)	
			Jan-June 2007	**Jul-Nov 2007**	**Jan-June 2007**	**Jul-Nov 2007**
Western Y-12 Area	GW-105	500 E	713	NS	<	NS
	GW-106	500 E	702	NS	<	NS
	GW-270	700 E	65.1	NS	<	NS
	GW-272	1,350 E	661	NS	0.0794	NS
	GW-108	800 SE	6,580	6,370	<	<
	GW-109	800 SE	9,350	NS	<	NS
	GW-274	1,300 SE	2,120	NS	<	NS
	GW-275	1,300 SE	8,560	NS	<	NS
Central Y-12 Area	55-2A	3,000 SE	184	170	<	<
	55-2B	3,000 SE	242	271	.	.
	55-2C	3,000 SE	230	NS	.	NS
	GW-204	>5,000 SE	NS	<	NS	0.122
		MCL	10		0.03	

Note: “NA” = Not analyzed; “NS” = Not sampled; “<“ = Concentration less than MCL; “.” = Not detected

For the wells with elevated nitrate concentrations, the CY 2007 sampling results are consistent with the concentration trends established by historical nitrate data (Table B.10), with time-series plots of the nitrate data (excluding analytical results that do not meet applicable DQOs) for each well generally showing:

- Decreasing nitrate concentration trends for wells GW-105, GW-108, GW-270, and GW-274, as illustrated by the nitrate data for wells GW-108 and GW-274 (Figure A.24). As noted previously, the decreasing concentrations of nitrate in the Nolichucky Shale downgradient (both east and west) of the former S-3 Ponds reflect a combination of substantially reduced flux of nitrate (and other similarly mobile contaminants) in the groundwater following closure of the site and installation of the low-permeability cap, and the cumulative effectiveness of various natural attenuation processes.

- Indeterminate nitrate concentration trends for wells 55-2A, GW-106, GW-109, and GW-275, as illustrated by the nitrate data for wells GW-109 and GW-275 (Figure A.24). The relatively unchanged levels of nitrate in the groundwater from these wells seems unusual considering the former S-3 Ponds have been closed for more than 20 years. The persistently high levels of nitrate in these wells probably reflect both the extensive volume (mass) of nitrate emplaced in the Nolichucky Shale beneath the site and the relatively low-permeability of the groundwater flow/transport pathways intercepted by the monitored interval in each well.

- Increasing nitrate concentration trends for well 55-2B, 55-2C, and GW-272, as shown by the nitrate data for wells 55-2B and 55-2C (Figure A.24). For example, nitrate concentrations in the shallow groundwater from well 55-2B increased more than 100% between June 1996 (117 mg/L) and August 2007 (271 mg/L). Increasing concentrations of nitrate in the groundwater from these wells potentially reflect the continued eastward (strike-parallel) movement of the center of mass of the S-3 Ponds contaminant plume in the Nolichucky Shale east of the site (DOE 1998).

As shown in Table 12, elevated uranium concentrations were reported for the groundwater samples collected during CY 2007 from only two wells: GW-272 in the western Y-12 area and well GW-204 in the central Y-12 area (Figure A.13). Historical data for well GW-272 indicates an increasing uranium concentration trend, as shown by the results for samples collected in October 1986 (0.008 mg/L), December 1989 (0.005 mg/L), October 2003 (0.0295 mg/L), and March 2007 (0.0794 mg/L). However, the significance of this trend is questionable because the large increase in concentration coincides with a 13-yr gap (January 1990 to April 2003) in the sampling history for the well. Well GW-204 is located on the east side of Bldg. 9204-2 and was installed in the pit from which an underground storage tank was excavated and removed in August 1988. The source of the uranium in the groundwater from this well has not been determined. Available data indicate a widely fluctuating, indeterminate long term uranium concentration trend. However, the sampling method appears to bias the analytical results for uranium at well GW-204 such that the decreasing concentration trend may be an artifact of the change from conventional sampling to low-flow sampling (B&W Y-12 2008). Considered separately, uranium results obtained with the conventional method show an indeterminate to slightly increasing trend, while uranium results obtained with the low-flow method show an indeterminate to slightly decreasing trend.

Volatile Organic Compounds

One or more dissolved VOCs were detected at individual or summed concentrations of 5 µg/L or more in at least one groundwater sample collected during CY 2007 from 33 aquitard wells in the East Fork Regime (Table B.10). Summarized below in Table 13, these sampling results show maximum concentrations of PCE, TCE, c12DCE, 11DCE, VC, CTET, MC, 12DCA, 1,2-dichloropropane (12DCP), benzene, ETB, and toluene reported for at least one of these wells exceed the respective drinking water MCL for each compound. The presence of dissolved VOCs in the groundwater at these wells reflect transport/migration from the contaminant plumes emplaced during historical operations of several source areas, including: the former S-3 Ponds, the WCPA, former petroleum fuel dispensing facilities associated with the Rust Garage Area and the East End Fuel Facility, and other unspecified sources within the industrial areas of Y-12. Moreover, the extremely high concentrations of VOCs detected in samples from some wells suggest the likely presence of DNAPL in the aquitard underlying several areas within Y-12, including south of Bldg. 9201-5, where CY 2007 sampling data for wells 55-3A, 55-3B, and 55-3C show the highest dissolved concentrations of chlorinated hydrocarbons in the East Fork Regime.

Table 13. East Fork Regime CY 2007: maximum VOC concentrations in surveillance monitoring aquitard wells

Y-12 Area/ Well	Maximum Concentration (µg/L)											
	PCE	TCE	c12 DCE	11 DCE	VC	CTET	MC	12DCA	12DCP	Ben-zene	ETB	Tol-uene
Western												
GW-108	<	<	.	<	.	.	50	.	.	<	.	.
GW-109	99	<	.	.	.	.	12	.	.	.	.	.
GW-192	<	<	<	.	.	.	.	.	.	.	.	.
GW-265	25	<	<	.	.	.	.	.	.	.	.	.
GW-269	24	5	<	160	.	.	.	.	.	.	.	.
GW-274	1,700	11	<	.	2	.	31	.	.	180	.	.
GW-332	1,100	200	1,100	25	13	.	.	.	.	.	.	.
GW-336	270	220	1,000	66	17	.	.	.	.	.	.	.
GW-337	520	430	1,600	72	15	.	.	.	.	.	.	.
Central												
55-2A	250	110	410	8	11	.	.	.	.	.	.	.
55-2B	680	230	700	18	16	.	.	.	.	.	.	.
55-2C	520	220	760	20	13	.	.	.	.	.	.	.
55-3A	22,000	1100	1,100	24	53	.	.	.	<	.	.	.
55-3B*	97,000	8,600	2,200	190	400	.	.	.	<	<	.	<
55-3C	27,000	1,700	1,900	58	210	.	.	.	.	.	.	.
56-1A	.	.	.	.	.	.	.	.	.	.	.	.
56-2A	6	.	.	.	.	.	.	.	.	.	.	.
56-2B	900	58	76	.	.	.	.	.	.	.	.	.
56-2C*	510	410	950	16	40	.	.	.	.	.	.	.
56-3A	50	6	<	.	.	.	.	.	.	.	.	.
56-3B*	260	17	<	.	.	.	.	.	.	.	.	.
56-3C	620	41	73	.	.	.	.	.	.	.	.	.
GW-656	36	2,600	140	180	5	.	.	.	<	.	.	.
GW-769	22	6	<	<	.	170	.	.	.	.	.	.
GW-770	.	.	.	.	.	25	.	.	.	.	.	.
GW-782*	92	45	<	46	.	.	.	.	.	.	.	.
GW-783	11	6	<	<	.	.	.	.	.	.	.	.
GW-791	30	.	.	.	.	.	.	.	.	.	.	.
GW-954-3	.	.	.	<	<	.	.	.	.	.	.	.
GW-956-2	<	<	.	.	.	.	.	.	.	.	.	.
Eastern												
GW-383	430	180	230	<	3	.	.	.	.	.	.	.
GW-658	.	.	.	.	.	.	24	530	11	8,100	1,000	3,300
GW-762	2,500	130	<	62	5	.	170	.	.	.	.	.
MCL	5	5	70	7	2	5	5	5	5	5	700	1,000

Note: "." = Not detected; "<" = Less than MCL; * = 14DXA results (see Section 4.1.1.1): only detected result was reported for the February sample from 56-3B (6 µg/L).

The CY 2007 sampling results for the wells listed in Table 13 support the long-term concentration trends indicated by respective historical VOC data (Table B.10), with time-series plots of the VOC results (individual compounds and/or summed concentrations of multiple VOCs) for each well, excluding results that do not meet applicable DQOs, generally showing:

- Decreasing concentration trends for VOCs in groundwater from 10 wells, including five wells in the western Y-12 area (GW-109, GW-265, GW-332, GW-336, and GW-337) and five wells in the central Y-12 area (55-2C, 56-2A, GW-656, GW-954, and GW-956), as illustrated by the summed concentrations of VOCs detected in the samples from wells GW-109 and GW-656 (Figure A.25). The decreasing concentration trends reflect a combination of several factors, including source-control actions, such as the RCRA closure of the former S-3 Ponds (wells GW-109). In the absence of similar actions at other areas, such as the unknown source(s) of VOCs in the groundwater from wells 55-2C and 56-2A, the decreasing concentrations of VOCs primarily reflect the cumulative effectiveness of various natural attenuation processes, including biologically mediated degradation. Additionally, the decreasing concentrations of VOCs in the groundwater from well 55-2C are concurrent with the clearly increasing concentrations of nitrate in the groundwater from this well (Figure A.24), which indicates separate source areas for the VOCs and nitrate.

- Indeterminate concentration trends for VOCs in groundwater from 11 wells, including two wells in the western Y-12 area (GW-108 and GW-192), eight wells in the central Y-12 area (55-3A, 55-3B, 56-1A, 56-2B, 56-3A, 56-3B, GW-782, and GW-791), and well GW-658 in the eastern Y-12 area, as illustrated by the summed concentrations of VOCs detected in wells GW-108 and GW-782 (Figure A.25). Widely variable but essentially unchanged levels of VOCs shown by nearly 20 years of sampling data for these wells suggest minimal corresponding changes in the relative advective flux of VOCs via the groundwater flow/transport pathways intercepted by the monitored interval in each well. The indeterminate concentration trends also suggest that the geochemical characteristics of the groundwater in most of these wells (i.e., excluding wells with elevated c12DCE concentrations) are not especially conducive to biologically-mediated degradation processes that would reduce VOC concentrations over the long term.

- Increasing concentration trends for VOCs in groundwater from four wells, including well GW-274 in the western Y-12 area and three wells (56-3C, GW-769, and GW-770) in the central Y-12 area, as illustrated by the summed concentrations of VOCs detected in wells GW-274 and GW-769 (Figure A.25). These wells yield VOC-contaminated groundwater from shallow depths (<60 ft bgs) in the Nolichucky Shale, and the increasing concentration trends suggest corresponding increases in the relative flux of dissolved VOCs through the hydrostratigraphic zones intercepted by the monitored interval in each well.

- A mixture of decreasing, indeterminate, and increasing concentration trends (Table B.10) for individual VOCs in groundwater from eight wells, including well GW-269 in the western Y-12 area, five wells in the central Y-12 area (55-2A, 55-2B, 55-3C, 56-2C, and GW-783), and two wells in the eastern Y-12 area (GW-383 and GW-762). For instance, the 12DCE (total) concentrations reported for samples from well GW-383 increased significantly between January 1991 (41 µg/L) and November 2007 (242 µg/L), whereas there are minimal differences in the initial and most recent concentrations of PCE (390 µg/L – 330 µg/L) and TCE (150 µg/L – 160 µg/L). These divergent concentrations trends are most likely attributable to biotic and/or chemical degradation processes, with stable levels of parent compounds (PCE and TCE) accompanied by increased levels of a related degradation compound (c12DCE).

Gross Alpha and Gross Beta Activity

Groundwater samples collected during CY 2007 from 29 aquitard wells in the East Fork Regime contained gross alpha activity and/or gross beta activity above the associated MDA and the corresponding TPU (Appendix E.3). However, as shown in Table 14, elevated gross alpha activity (>15 pCi/L) and/or gross beta activity (>50 pCi/L) was reported for only seven of these wells. Note that the elevated results for well 55-2B in August 2007 are inconsistent (much higher) with respect to available historical data and do not meet DQOs of the Y-12 GWPP. These results (flagged with a “Q” qualifier) are considered likely sampling or analytical artifacts and are excluded from further evaluation.

Table 14. East Fork Regime CY 2007: elevated gross alpha activity and gross beta activity in surveillance monitoring aquitard wells

Location and Well	Date Sampled	Gross Alpha (pCi/L)				Gross Beta (pCi/L)			
		MDA	Activity	±	TPU	MDA	Activity	±	TPU
Western Y-12 Area									
GW-108	01/04/07	70	331	±	80.4	105	18,400	±	2950
GW-108	07/10/07	55.5	68.9	±	38.2	102	14,900	±	2390
GW-109	06/20/07	340		<MDA		660	2,800	±	490
GW-272	03/14/07	25	34	±	34	61		<MDA	
GW-274	03/13/07	97		<MDA		170	4,400	±	250
Central Y-12 Area									
55-2B	02/20/07	8.5		<MDA		13		<	
55-2B	08/23/07	21	23 Q	±	18	23	59 Q	±	17
GW-204	11/13/07	3.9	78	±	7.6	7.7		<	
GW-782	11/27/07	2.9	25	±	5.3	8.5		<	
Screening Level		15				50			

Note: “<“ = Less than the screening level; Q = Inconsistent with other results for the well

Groundwater transport/migration of alpha- and beta-emitting radionuclides from the contaminant plume emplaced during historical operations of the former S-3 Ponds accounts for the elevated levels of gross alpha and/or gross beta activity in the groundwater from the each of the above-listed wells in the western Y-12 area. Uranium isotopes (and daughter products) are the primary alpha-emitting radionuclides in the contaminated plume originating from this site and probably account for some of the gross beta activity in the groundwater, but Tc-99, which is the “signature” component of the S-3 Ponds contaminant plume in the East Fork Regime, is the principal beta-emitting radionuclide in the Nolichucky Shale east of the site. The elevated gross alpha activity reported for wells GW-204 and GW-782 indicates groundwater transport of radiological contaminants (primarily uranium isotopes) from unspecified sources within the central Y-12 area (Figure A.9).

The gross alpha and gross beta activity reported for the groundwater samples collected during CY 2007 from the wells listed in Table 14 support the long-term trends indicated by historical data for each well (Table B.10). Time-series plots of the gross alpha and/or gross beta activity reported for each applicable well (excluding results that do not meet applicable DQOs) show:

- Indeterminate trends for gross alpha and/or gross beta activity in groundwater from each of the above-listed wells (Table B.10), as illustrated by the gross alpha activity results for wells GW-108 and GW-204 and by gross beta activity results for wells GW-109 and GW-274 (Figure A.26). Widely variable and not clearly increasing or decreasing levels of gross alpha activity in the groundwater from well GW-108 suggest minimal corresponding change in the relative flux of alpha-emitting radionuclides (primarily uranium isotopes) in the groundwater flow system east of the S-3 Site. This indicates relatively limited transport of uranium isotopes beyond the low-pH groundwater nearest the site.

- An increasing trend for gross beta activity in groundwater from well GW-108 (Figure A.26). The increasing beta activity reflects a corresponding increase in the relative flux of Tc-99 (and possibly other beta-emitting radionuclides) via the groundwater flow/transport pathways intercepted by the monitored interval in the well. Also, the increasing trend for gross beta activity contrasts with the decreasing levels of nitrate in the groundwater from the well. Considering both contaminants share a common source (the S-3 Ponds), the increasing levels of gross beta activity suggest that the concentrations of Tc-99 in the groundwater remain relatively unaffected by natural attenuation processes that work to reduce nitrate levels in the groundwater.

4.1.2.2 Aquifer Wells

Elevated concentrations of one or more of the principal groundwater contaminants at Y-12 were reported for groundwater samples collected during CY 2007 from 22 surveillance monitoring aquifer wells in the East Fork Regime (Table B.10), including three wells located in the western Y-12 area; nine wells located in the central Y-12 area; eight wells in the eastern Y-12 area; and two wells in Union Valley east of the ORR boundary.

Nitrate and Uranium
As shown in Table 15, elevated concentrations of nitrate (>10 mg/L) or total uranium (>0.03 mg/L) were detected in the groundwater samples collected during CY 2007 from seven aquifer wells in the East Fork Regime. Elevated concentrations of nitrate or uranium in the groundwater from these wells reflect transport/migration from the contaminant plumes emplaced during historical operations of the S-2 Site (GW-251, GW-253, and GW-698), the Uranium Oxide Vault (GW-219), the Oil Skimmer Basin (GW-154 and GW-223), and one or more unspecified sources of uranium in the central or eastern Y-12 area (GW-605). As in previous years, the CY 2007 sampling results show the highest nitrate concentrations in the aquifer (Maynardville Limestone) occur in groundwater immediately downgradient (east) of the S-2 Site (GW-253), a closed waste disposal facility located in the southwestern section of Y-12, with the data for well GW-698 indicating nitrate concentrations above 100 mg/L in the groundwater at least 2,500 ft downgradient of the site (Figure A.7). Additionally, as shown below, the highest concentrations of uranium were reported for aquifer wells located in the central Y-12 area near the Uranium Oxide Vault (GW-219) and in eastern Y-12 area near the former Oil Skimmer Basin (GW-154).

Table 15. East Fork Regime CY 2007: elevated nitrate and uranium concentrations in surveillance monitoring aquifer wells

Well Location/Number		Nitrate (mg/L)		Uranium (mg/L)	
		Jan-June 2007	July-Nov 2007	Jan-June 2007	July-Nov 2007
Western Y-12 Area	GW-251	49.7	NS	<	NS
	GW-253	551	NS	<	NS
Central Y-12 Area	GW-219	NS	<	NS	0.746
	GW-698	163	210	<	<
Eastern Y-12 Area	GW-154	NA	NA	0.3	0.44
	GW-223	.	.	0.041	0.038
	GW-605	<	<	0.15	0.11
	MCL	10		0.03	

Note: "." = Not detected; "<" = Less than MCL; NS = Not sampled; NA = Not analyzed

The CY 2007 sampling results for the wells shown in Table 15 support the respective long-term concentration trends indicated by historical data (Table B.10), with time-series plots of the nitrate and uranium data for these wells generally showing:

- A decreasing concentration trend for nitrate in well GW-251 that is dominated by wide seasonal fluctuations (Figure A.27), with the highest concentrations typically evident during seasonally low-flow conditions (summer and fall). The apparent relationship with seasonal flow conditions suggest that the nitrate concentrations are influenced by local inflow of uncontaminated (or less nitrate-contaminated) seasonal (and episodic) recharge, which indicates that the monitored interval in the well intercepts active groundwater flow/transport pathways. Also, the overall decrease in nitrate levels in the groundwater from this well probably reflects a combination of continued reduced flux of nitrate in the Maynardville Limestone downgradient of the S-2 Site, which was closed in 1951, and the long-term cumulative effectiveness of various natural attenuation processes.

- Indeterminate concentration trends for nitrate in well GW-253 (Figure A.27) and well GW-698. The relatively unchanged levels of nitrate in the groundwater from these wells suggest minimal long-term change in the overall flux of nitrate via the groundwater flow/transport pathways intercepted by the monitored interval in each well. Such minimal changes in the relative rate of nitrate flux seem unusual considering the S-2 Site closed more than 50 years ago, especially in light of the high mobility of nitrate in groundwater.

- Indeterminate concentration trends for uranium in wells GW-154, GW-219, and GW-605. For example, the uranium data obtained since 1991 for well GW-154 (Figure A.27) is dominated by conspicuous "peak" concentrations evident in May 1995 (0.66 mg/L), November 1996 (0.47 mg/L), and July 2001 (1.37 mg/L), with the latter result corresponding with a sharp spike in the groundwater elevation in the well. This relationship suggests wide temporal changes in the relative advective flux of uranium in the shallow groundwater flow system near this well. Moreover, the uranium results obtained for well GW-154 since July 2001 define a decreasing trend through August 2007 (0.44 mg/L), which generally coincides with full-time operation of a groundwater extraction well (GW-845) located approximately 1,250 ft southeast of well GW-154 (Figure A.13).

- An increasing concentration trend for uranium in well GW-223 (Figure A.27). The uranium levels indicated by the most recent sampling results reflect concentrations that are several orders-of-magnitude higher than the uranium data for samples collected in the late 1980s and early 1990s. The long-term increase in uranium concentrations undoubtedly reflects a corresponding increase in the relative flux of uranium via the groundwater flowpaths intercepted by the monitored interval in this well, although the suspected source of the uranium, the former Oil Skimmer Basin, was closed along with New Hope Pond in 1988.

Volatile Organic Compounds

Groundwater samples collected during CY 2007 from 20 aquifer wells in the East Fork Regime contained one or more dissolved VOCs at individual or summed concentrations of 5 µg/L or more (Table B.10). As shown in Table 16, the maximum concentrations of PCE, TCE, c12DCE, VC, CTET, chloroform, and/or MC reported for the groundwater samples from several of these wells exceed the respective drinking water MCLs. The presence of VOCs in the groundwater from these wells reflect transport/migration of the intermingled plume(s) of dissolved VOCs in the Maynardville Limestone (Figure A.8). Additionally, the summed concentrations of chlorinated hydrocarbons (PCE, TCE, c12DCE, CTET, and chloroform) detected in the groundwater samples collected during CY 2007 from aquifer wells GW-170 (7–9 µg/L) and GW-230 (5 µg/L) are representative of concentrations within the plume of dissolved VOCs that extends eastward from Y-12 (parallel with geologic strike in the Maynardville Limestone) into Union Valley east of the ORR boundary along Scarboro Road (Figure A.8). Note that none of the CY 2007 sampling results for the wells in Union Valley exceed the applicable drinking water MCLs.

Table 16. East Fork Regime CY 2007: maximum VOC concentrations in surveillance monitoring aquifer wells

Location and Well	Maximum Concentration (µg/L)						
	PCE	TCE	c12DCE	VC	CTET	Chloroform	MC
Western Y-12 Area							
GW-251	100	47	<	.	.	<	.
GW-253	490	260	240	100	21 J	<	19 JB
GW-618	6	5	<	.	.	.	.
Central Y-12 Area							
GW-686	.	.	<	2	.	.	.
GW-690	45	<	<	.	.	.	.
GW-691	2,600	18	<	.	.	.	.
GW-692	<	<	<	.	.	<	.
GW-698	160	610	<	.	9	<	.
GW-700	62	13	<	.	.	.	.
GW-820	3,400	800	1,200	81	.	.	.
GW-959	.	.	<	.	.	.	.
Eastern Y-12 Area							
GW-153	<	.	.	.	65	<	.
GW-223	42	15	72	5	.	.	.
GW-240	.	.	.	.	5	<	.
GW-381	.	.	<	.	5	.	.
GW-382	23	.	<	.	430	140	6 J
GW-605	110	120	180	2	110	<	.
GW-606	5	.	.	.	39	94	.
Union Valley							
GW-170	<	<	.	.	<	<	< B
GW-230	.	.	<	<	.	.	.
MCL	5	5	70	2	5	80*	5

Note: “. ” = Not detected; “<“ = Less than the MCL; J = Estimated value; B = Also detected in associated method blank sample; * = MCL for total trihalomethanes (byproducts of drinking water disinfection with chlorine)

The CY 2007 VOC results for the aquifer wells listed in Table 16 support the long-term concentration trends indicated by respective historical data (Table B.10), with time-series plots of the VOC data (individual compounds and/or summed concentrations of multiple VOCs) for each well, excluding results that do not meet applicable DQOs, generally showing:

- Variable but generally decreasing trends for VOC concentrations in groundwater from nine wells (GW-153, GW-170, GW-230, GW-240, GW-381, GW-382 , GW-618, GW-690, and GW-700), as illustrated by the summed VOC concentrations detected in wells GW-153 and GW-382 (Figure A.28). The decreasing concentration trends reflect a combination of several factors, including reduced flux of VOCs from the applicable source areas along with the long-term cumulative effects of various natural attenuation processes, including biologically mediated degradation. Additionally, the decreasing concentrations of VOCs in the groundwater from wells GW-153 and GW-240 may be at least partially attributable to the full-time operation of the groundwater extraction well (GW-845) located approximately 600 ft directly east (parallel with geologic strike) of these wells (see Section 2.3.1.1 and Figure A.13).

- Indeterminate concentration trends for VOCs in groundwater from five wells (GW-251, GW-253, GW-686, GW-820, and GW-959), as illustrated by the summed concentrations of VOCs detected in the groundwater samples from wells GW-251 and GW-820 (Figure A.28). The summed VOC concentrations in the samples from well GW-251 show clearly seasonal fluctuations, with high concentrations evident in samples collected during seasonally low flow conditions. As noted previously regarding nitrate levels in well GW-251, this relationship suggests seasonal (and episodic) inflow of uncontaminated recharge via the groundwater flowpaths intercepted by the monitored interval in the well.

- Increasing concentration trends for VOCs in groundwater from three wells: GW-691 (Figure A.28) and GW-692 located near the Coal Pile Trench in the central Y-12 area, and well GW-605 (Figure A.28) in the eastern Y-12 area (Figure A.13). The summed VOC concentrations in the samples from well GW-605 show seasonal fluctuations, with high concentrations typically evident in samples collected during seasonally low flow conditions. This relationship suggests seasonal (and episodic) inflow of uncontaminated recharge via the groundwater flowpaths intercepted by the monitored interval in the well.

- A combination of decreasing, indeterminate, and increasing trends for individual VOCs in groundwater from wells GW-223, GW-606, and GW-698 (Table B.10). Divergent concentration trends for VOCs in groundwater from these wells may reflect differing sources of individual compounds and/or be partially attributable to biologically mediated degradation of the compounds. For instance, the 12DCE (total) concentrations reported for samples from well GW-223 (located near NHP, Figure A.13) increased between February 1991 (30 µg/L) and March 2007 (72 µg/L), whereas significant concentration decreases were reported between the initial and most recent concentrations of PCE (190 µg/L - 42 µg/L) and TCE (42 µg/L - 15 µg/L).

Gross Alpha and Gross Beta

Groundwater samples collected during CY 2007 from 17 aquifer wells in the East Fork Regime contained gross alpha activity and/or gross beta activity above the MDA and corresponding TPU (Appendix E.3). However, as shown in Table 17, elevated gross alpha activity (>15 pCi/L) or gross beta activity (>50 pCi/L) was reported only for five of these wells. Elevated levels of gross alpha and gross beta activity in the groundwater at these aquifer wells reflect the transport/migration of radiological contaminants (primarily uranium isotopes) from the contaminant plume emplaced during historical operations of the S-2 Site (GW-253), the Uranium Oxide Vault (GW-219), the Oil Skimmer Basin (GW-154), and one or more unspecified sources in the central or eastern Y-12 area (GW-605). Note that the elevated gross alpha activity for well GW-698 in October 2007 is inconsistent (much higher) with respect to available historical data and does not meet DQOs of the Y-12 GWPP. This result (flagged with a “Q” qualifier) is considered to be a sampling or analytical artifact and is excluded from further evaluation.

Table 17. East Fork Regime CY 2007: elevated gross alpha activity and gross beta activity in surveillance monitoring aquifer wells

Well	Date Sampled	Gross Alpha (pCi/L)		Gross Beta (pCi/L)	
		MDA	Activity ± TPU	MDA	Activity ± TPU
Western Y-12 Area					
GW-253	03/08/07	3.05	30.3 ± 5.9	5.37	<
Central Y-12 Area					
GW-219	11/28/07	7.1	260 ± 16	10	65 ± 9.1
GW-698	06/13/07	4.4	<MDA	14	<MDA
GW-698	10/16/07	11	40 Q ± 14	17	<
Eastern Y-12 Area					
GW-154	03/05/07	2.38	335 ± 55.3	7.12	<
GW-154	08/15/07	2.82	275 ± 46.5	7.22	89.3 ± 15.6
GW-605	01/03/07	3.48	47.8 ± 9.88	4.54	<
GW-605	07/09/07	2.61	49.4 ± 10.2	4.41	<
Screening Level		15		50	

Note: "<" = Less than the screening level; Q = Inconsistent with other results for the well

The gross alpha and gross beta activity reported for the groundwater samples collected during CY 2007 from the wells listed in Table 17 support the long-term trends indicated by historical data for each well (Table B.10). Time-series plots of the gross alpha and/or gross beta activity reported for each applicable well generally show:

- Widely variable but generally decreasing trends for gross alpha activity in well GW-253 (Figure A.29) and gross beta activity in well GW-154 (Figure A.29). Decreasing levels of gross alpha activity indicated by the data for well GW-253 probably reflects the similar decrease in the concentrations of uranium isotopes in the groundwater from this well.

- Widely variable, indeterminate long-term trends for gross alpha activity in groundwater from wells GW-154, GW-219, and GW-605, and for gross beta activity at well GW-219. As illustrated by the gross alpha results for well GW-605 and gross beta results for well GW-219 (Figure A.29), these trends suggest minimal relative change in the overall flux of uranium isotopes via the hydrostratigraphic intervals monitored by the wells. These indeterminate trends are consistent with the indeterminate long-term concentration trend evident for total uranium in the groundwater from wells GW-219 and GW-605.

4.1.3 Chestnut Ridge Regime

The CY 2007 groundwater sampling results for 47 wells on Chestnut Ridge meet the requirements of surveillance monitoring in the Chestnut Ridge Regime. Sampling results show that most of these wells continue to yield uncontaminated groundwater, with data for a few wells being likely artifacts of well installation/construction, including elevated nickel from corrosion of the stainless steel well screen (GW-305) and the geochemical influence of cement grout, such as strongly basic pH and unusually high potassium concentrations (wells GW-205 and GW-757). Aside from these artifacts, VOCs were the contaminants most frequently detected in the groundwater samples collected during CY 2007, with at least one principal compound detected in samples from 10 wells (Table B.11).

The CRSP are the source of the VOCs in the groundwater at eight of these wells (GW-174, GW-176, GW-177, GW-179, GW-180, GW-612, GW-796, and GW-798). Historical operation of the eastern and western waste disposal trench areas at the CRSP emplaced an elongated plume of dissolved VOCs in the groundwater that extends more than 2,500 ft east-northeast along the ridge crest (parallel with geologic strike) and at least 500 ft to the north and south down the ridge flanks (Figure A.8). The existing network of monitoring wells at the site shows that 111TCA, 11DCA, and 11DCE are the primary compounds in the groundwater near the western disposal trench area and PCE and 12DCE are the principal compounds in the groundwater near the eastern disposal trench area. Elongation of the VOC plume along the axis of the ridge and the distribution of plume constituents relative to suspected source trenches indicate primarily west-to-east groundwater flow/contaminant transport via strike-parallel flowpaths in the Knox Group (e.g., bedding-plane fractures). However, detection of VOCs in groundwater from wells located south and southeast of the site (down dip and perpendicular to strike) suggests that conduit transport from the site also occurs.

As shown below in Table 18, PCE, 11DCE, 111TCA, 11DCA, trichlorofluoromethane (TCFM) are the VOCs detected most frequently in the groundwater samples collected from CRSP monitoring wells during CY 2007, with maximum concentration of PCE and/or 11DCE reported for wells GW-176, GW-179, GW-180, GW-612, and GW-798 exceeding the respective drinking water MCLs.

Table 18. Chestnut Ridge Regime CY 2007: maximum VOC concentrations in surveillance monitoring wells

Well	Maximum Concentration (µg/L)							
	PCE	**c12DCE**	**11DCE**	**111TCA**	**11DCA**	**TCFM**	**CTET**	**Chloroform**
GW-174*	4 J	.	.	.	.	7	.	.
GW-176*	3 J	.	23	15	51	.	.	.
GW-177*	.	.	6	8	26	NR	.	.
GW-179*	1 J	.	18	11	31	5	.	.
GW-180*	18	.	.	.	.	4 J	.	.
GW-305	.	.	9.3	19	31	.	2.6 J	.
GW-544	.	.	.	.	.	.	.	3.1
GW-612*	2 J	.	26	12	43	.	.	.
GW-796*	.	.	0.16 J	0.5 J	0.32 J	.	.	.
GW-798*	5.5	4.3 J	2.9	1.5	2	12	.	.
MCL	5	70	7	200	NA	NA	5	NA

Note: “. ” = Not detected; * = Located near the CRSP; J = Estimated value; NR = Not reported; NA = Not applicable

The presence of dissolved VOCs in the groundwater from most of the CRSP wells generally defines the relative strike- and dip-parallel extent of groundwater transport of the more mobile components of the VOC plume originating from disposal trenches at the CRSP (Figure A.8). Additionally, the concentrations of the primary components of the plume (PCE and 111TCA) have generally decreased, while the concentrations of 111TCA degradation products (11DCE and/or 11DCA) have increased or remained stable, which suggests active biotic and/or chemical degradation of the 111TCA. The CY 2007 sampling results generally continue the decreasing or indeterminate long-term concentration trends indicated by respective historical VOC data (Table B.11), as illustrated by a time-series plot of VOC data for well GW-798, which appears to decrease following peak concentrations in January 2003 (Figure A.30).

Each of the groundwater samples collected from well GW-305 during CY 2007 contained 11DCE, 11DCA, and 111TCA, with CTET detected in the sample collected in January 2007 (Table 18). The source of the VOCs in the groundwater from the well is unconfirmed. Along with the historical data, the CY 2007 monitoring results continue the concentration trends evident after the sequential detection of 111TCA, 11DCA, and 11DCE beginning in January 1992 (Figure A.30). The data show the arrival of the parent compound (111TCA) followed by the related degradation products (11DCA and 11DCE), with fairly stable 111TCA and 11DCE trends after January 1999 and a steadily increasing trend for 11DCA through CY 2007.

Chloroform was detected in the groundwater samples collected from well GW-544 during CY 2007, which is consistent with historical data for the well, which show a generally decreasing trend following the maximum concentration (16 µg/L) evident in January 2004 (Figure A.30). The presence of chloroform and other trihalomethanes (e.g., bromodichloromethane) in the groundwater samples from this well is most likely related to local recharge of chlorinated water that occurred throughout the operation of a septic drain field for sanitary hand washing and toilet facilities housed in a portable building located about 500 ft east (uphill and hydraulically upgradient) of the well. Chloroform and other trihalomethanes form as a consequence of chemical reactions between chlorine in the treated (chlorinated) water and natural organic material in the subsurface. In April 2004, the restroom facilities were permanently closed and the flow-control valve for the potable water supply pipeline to the building was turned off. Thus, the septic tank/drain field no longer promotes local recharge of chlorinated water into the Knox Aquifer upgradient of well GW-544. The reduced levels of chloroform in the groundwater since January 2004 indicates that the source of the chloroform is no longer active.

4.2 EXIT PATHWAY/PERIMETER MONITORING

This section describes results of groundwater and surface water quality monitoring performed during CY 2007 in areas where contaminants associated with Y-12 are most likely to be transported beyond the boundary of the DOE ORR. Separate discussions of the monitoring data obtained from respective networks of exit pathway/perimeter sampling locations in the Bear Creek, East Fork, and Chestnut Ridge hydrogeologic regimes are provided.

4.2.1 Bear Creek Regime

The CY 2007 monitoring results and respective historical data for the monitoring wells, springs, and surface water sampling locations listed (upstream to downstream) in Table 19 are considered exit pathway/perimeter monitoring in the Bear Creek Regime because they are (1) monitoring wells that are located in a perimeter region (Exit Pathway Picket W, Figure A.12), (2) springs that represent natural groundwater discharge locations, and (3) surface water stations that measure water quality in strategic locations along Bear Creek.

Table 19. Bear Creek Regime CY 2007: sampling locations used for exit pathway/perimeter monitoring

Bear Creek Area	Monitoring Wells		Springs	Surface Water Stations	
	Well Number	Monitored Interval Depth (ft bgs)		Bear Creek Main Channel	Bear Creek Tributaries
Upper			SS-1		NT-01
Middle			SS-4 SS-5		EMWNT-03A EMW-VWUNDER (NT-4) NT-04 EMWNT-05 EMW-VWEIR (NT-5) NT-07 NT-08
Lower	GW-712 GW-713 GW-714	441.5 - 457.5 305.0 - 315.2 115.1 - 145.0	SS-6	BCK-04.55	

For the purposes of this report, these sampling locations are assigned to three areas: Upper, Middle, and Lower Bear Creek. Upper Bear Creek encompasses the surface water sampling locations upstream (east) of the confluence of NT-2 with Bear Creek (Figure A.11), including one spring (SS-1) and the sampling location in NT-1 (NT-01). Middle Bear Creek encompasses the surface water sampling stations and springs that are located along Bear Creek between NT-2 and NT-9 (Figure A.11), including two springs (SS-4 and SS-5) and sampling locations in NT-3 (EMWNT-03A), NT-4 (NT-04 and EMW-VWUNDER), NT-5 (EMWNT-05 and EMW-VWEIR), NT-7 (NT-07), and NT-8 (NT-08). For CY 2007, lower Bear Creek sampling locations (downstream of NT-9) include the monitoring wells listed in Table 19, the surface water station BCK-04.55, and spring SS-6 (Figure A.11).

4.2.1.1 Upper Bear Creek

The chemical quality of surface water in Upper Bear Creek is largely controlled by inflow of groundwater containing the primary components of the contaminant plume emplaced during historical operations of the former S-3 Ponds. To the west of this site, highly contaminated groundwater discharges from the aquitard (Nolichucky Shale) as base flow into NT-1, which enters Bear Creek about 2,500 ft downstream of the site. Also, the highly contaminated groundwater in the Nolichucky Shale extends west of NT-1 (parallel with geologic strike) where it upwells into the shallow flow system, continues westward, and ultimately discharges into NT-2, which enters the main channel of Bear Creek about 1,400 ft downstream of its confluence with NT-1 (Figure A.11). In addition to the influx of contaminants from the NT-1 and NT-2 catchments, contaminated groundwater in the Maynardville Limestone discharges into Bear Creek via seeps and springs (e.g., SS-1) along the main channel of the creek.

As shown in Table 20, monitoring results obtained during CY 2007 show nitrate concentrations, (total) uranium levels, and gross beta activity in Upper Bear Creek remain well above respective screening levels. Note that spring SS-1 was dry when sampling was scheduled (Table B.2), and no samples were collected at this location during CY 2007.

Table 20. Upper Bear Creek CY 2007: maximum contaminant concentrations

Sampling Point	Nitrate (mg/L)	Uranium (mg/L)	PCE (µg/L)	Radioactivity (pCi/)	
				Alpha	Beta
NT-01	**344**	**0.0458**	**43**	.	**130**
Screening Level	10	0.03	5	15	50

Note: "**.**" = Not detected; **BOLD** = Exceeds screening level

These results are consistent with historical data and show that contaminants associated with historical operations at Y-12 continue to substantially impact the quality of surface water in Upper Bear Creek.

4.2.1.2 Middle Bear Creek

Surface water quality in Middle Bear Creek is impacted by contaminants from the former S-3 Ponds (nitrate, uranium, and radioactivity), the former BYBY/HCDA (uranium and VOCs), and the BCBG WMA (uranium, VOCs, and radioactivity). Also, results of a study by the U.S. Geological Survey show that much of Middle Bear Creek loses flow to the Maynardville Limestone, particularly the section of the channel immediately south of the OLF WMA. This section of the main channel of Bear Creek plays an important role in transferring contaminants from the creek into the groundwater flow system (DOE 1997a).

As shown in Table 21, elevated concentrations (i.e., > screening level) of one or more of the principal contaminants in the Bear Creek Regime were reported for six of the exit pathway sampling locations in Middle Bear Creek. The highest nitrate concentrations were reported for spring SS-4, south of the BCBG WMA (Figure A.7), and the highest uranium levels were reported for the sampling location in NT-8, west of the BCBG WMA (Figure A.11). As noted previously, the former BYBY was a major source of uranium flux in Bear Creek via NT-3, but uranium levels in NT-3 decreased substantially in response to the CERCLA remedial actions at the site (see Section 2.4.1.2).

Table 21. Middle Bear Creek CY 2007: maximum contaminant concentrations

Sampling Point	Nitrate (mg/L)	Uranium (mg/L)	Chloroethenes (µg/L)					Radioactivity (pCi/L)	
			PCE	TCE	c12DCE	11DCE	VC	Alpha	Beta
EMWNT-03A	NA	.	.	.	.	.	.	NA.	NA
NT-04	NA	0.021 Q	.	.	7	NA	.	NA	NA
EMW-VWUNDER	NA	.	.	.	.	NA	.	NA	NA
EMWNT-05	NA	.	.	.	.	.	.	NA	NA
EMW-VWEIR	NA	0.0612 Q	.	.	.	.	.	NA	NA
SS-4	**38.6**	**0.0958**	.	**7**	10	1 J	.	9.9	31
NT-07	0.044	0.018	**23**	**16**	**74**	5 J	**3 J**	NA	NA
NT-08	1.8	**0.26**	**11**	**7**	63	.	2 J	NA	NA
SS-5	6.41	0.0277	.	.	2 J	.	.	**16**	**54**
Screening Level	10	0.03	5	5	70	7	2	15	50

Note: "**.**" = Not detected; J = Estimated concentration; Q = Inconsistent with other results from the location; NA = Not analyzed; **BOLD** = Exceeds screening level

These monitoring results are generally consistent with historical data for each applicable sampling location (except for uranium at NT-04 and EMW-VWEIR) and show that contaminants associated with Y-12, particularly total uranium and VOCs, continue to impact the quality of surface water in Middle Bear Creek.

4.2.1.3 Lower Bear Creek

The quality of groundwater and surface water in Lower Bear Creek is substantially less impacted by contaminants present in upstream areas of BCV. As shown by the CY 2007 monitoring results summarized below in Table 22, the concentration levels of all principal contaminants were below applicable screening levels.

Table 22. Lower Bear Creek CY 2007: maximum contaminant concentrations

Sampling Point	Nitrate (mg/L)	Uranium (mg/L)	Summed VOCs (µg/L)	Radioactivity (pCi/L)	
				Gross Alpha	Gross Beta
GW-712	.	.	.	.	.
GW-713	.	.	.	.	3.72
GW-714	0.36	.	.	.	.
SS-6	0.71	0.01	.	4.77	6.33
BCK-04.55	1.07	0.0184	.	14	.
Screening Level	10	0.03	MCL or >5 µg/L	15	50

Note: "**.**" = Not detected

The CY 2007 monitoring results for each groundwater and surface water sampling location are generally consistent with respective historical data and show that contaminants associated with Y-12 continue to impact the quality of surface water in Lower Bear Creek. Also, sampling results for the exit pathway monitoring wells do not indicate significant impacts on groundwater quality.

4.2.2 East Fork Regime

The CY 2007 monitoring results and respective historical data for the monitoring wells and surface water sampling locations listed below in Table 23 meet the requirements of exit pathway/perimeter monitoring in the East Fork Regime.

Table 23. East Fork Regime CY 2007: sampling locations for exit pathway/perimeter monitoring

Monitoring Wells				Surface Water Sampling Locations	
Well Number	**Monitored Interval Depth (ft bgs)**	**Well Number**	**Monitored Interval Depth (ft bgs)**	**UEFPC**	**North of Pine Ridge**
GW-151	85.0 - 110.0	GW-744	55.0 - 69.5	200A6	GHK2.51WSW
GW-220	31.0 - 45.2	GW-747	60.8 - 73.0	STATION 8	NPR07.0SW
GW-722	75.0 - 644.3	GW-750	61.2 - 72.7		NPR12.0SW
GW-733	240.1 - 256.5	GW-816	2.9 - 15.8		NPR23.0SW
GW-735	67.5 - 79.2	GW-832	4.0 - 11.8		

The monitoring wells are located near the eastern end of Y-12 and are hydraulically downgradient (north/northeast or east/southeast) of NHP/Lake Reality, with all but three of the wells (GW-151, GW-220, and GW-832) being within 500 ft of the ORR boundary along Scarboro Road (Figure A.13). The surface water sampling stations in the East Fork Regime include an outfall (200A6) and a sampling location in UEFPC (Station 8) located in the south-central part of Y-12 (Figure A.13). In addition to these surface water sampling locations within the East Fork Regime, four sampling stations (GHK2.51WSW, NPR07.0SW, NPR12.0SW, and NPR23.0SW) located in drainage features along the ORR boundary north of Pine Ridge (Figure A.14) also serve as exit pathway/perimeter monitoring locations.

4.2.2.1 Groundwater

At least one of the groundwater samples collected during CY 2007 from exit pathway wells GW-151, GW-220, GW-722, and GW-832 contained summed concentrations of dissolved VOCs of at least 5 µg/L. Each of these wells are located within 1,000 ft of the groundwater extraction well (GW-845) being used to capture the plume of dissolved VOCs present in the groundwater (Maynardville Limestone) extending from the eastern end of Y-12 into Union Valley east of the ORR boundary along Scarboro Road (see Section 2.3.1.1 and Figure A.13). As shown in Table 24, the groundwater samples from each of these wells contained concentrations of PCE, TCE, and/or CTET that exceed respective drinking water MCLs.

Table 24. East Fork Regime CY 2007: maximum VOC concentrations in exit pathway/perimeter monitoring wells

Well	Maximum Concentration (µg/L)						
	PCE	TCE	c12DCE	VC	CTET	Chloroform	MC
GW-151	**660**	**110**	**78**	0.8 J	**1,100**	78	**83 B**
GW-220	**650**	**130**	63	.	**1,100**	78	.
GW-722-22	**6**	2 J	.	.	**15**	2 J	2 J
GW-722-20	**12**	2 J	1 J	.	**71**	13	2 J
GW-722-17	**7**	2 J	.	.	**47**	9	1 J
GW-722-14	4 J	1 J	.	.	**26**	4 J	2 J
GW-832	**7**	1 J	1 J	.	**10**	2 J	.
MCL	5	5	70	2	5	NA	5

Note: "**.**" = Not detected; J = Estimated concentration ; B = Also detected in the associated method blank sample; NA = Not applicable; **BOLD** = Exceeds MCL

These results are consistent with respective historical data for each well and illustrate the range of VOC concentrations within in the shallow karst network (GW-151, GW-220, and GW-832) and deeper bedrock intervals (GW-722) in the Maynardville Limestone at the east end of Y-12. Additionally, the CY 2007 monitoring results continue the long-term concentration trends indicated by respective historical VOC data for these wells (Table B.10), as illustrated by the decreasing PCE trends for sampling ports in Westbay well GW-722 (e.g., GW-722-14), the indeterminate PCE trend for well GW-832, and the increasing PCE trend for well GW-151 (Figure A.31). The VOC concentration trends evident for some wells, particularly CTET at Westbay well GW-722, suggest a direct response to the long-term operation of groundwater extraction well GW-845 (Figure A.32).

4.2.2.2 Surface Water

Based on maximum concentrations reported for samples collected during CY 2007, summarized below in Table 25 (sampling stations are listed in order from farthest upstream to farthest downstream), at least one of the primary groundwater contaminants associated with Y-12 was detected at each of the surface water sampling stations used for exit pathway/perimeter monitoring in the East Fork Regime.

Table 25. East Fork Regime CY 2007: maximum contaminant concentrations at the UEFPC exit pathway/perimeter sampling locations

Sampling Point	Nitrate (mg/L)	Uranium (mg/L)	Summed VOCs (µg/L)	Radioactivity (pCi/L)	
				Alpha	Beta
200A6	NA	**0.156**	NA	NA	NA
Station 8	NA	**0.058**	NA	8.41	9.12
Screening Level	10	0.03	5	15	50

Note: NA = not analyzed; **BOLD** = Exceeds screening level

These results show that uranium concentrations exceed the drinking water MCL (0.03 mg/L) at both locations. Additionally, the results for these stations continue respective indeterminate long-term concentration trends indicated by historical monitoring results for each sampling location (Table B.10). Principal groundwater contaminant concentrations evident at these locations during CY 2007 reflect the continued impact of legacy Y-12 operations on the quality of surface water in UEFPC upstream of the ORR boundary. Note that mercury is a primary contaminant in the surface water of the East Fork Regime that is monitored by other programs (e.g., NPDES), and results of flow-proportionate sampling performed under these monitoring programs are not addressed in this report. Mercury is rarely detected in groundwater samples because of its low solubility.

Although not a principal groundwater contaminant because of very low solubility, mercury is a primary contaminant of the surface water in the East Fork Regime as a legacy of historical operations at Y-12. Extensive sampling (flow proportionate and grab samples) is performed by other monitoring programs (e.g., NPDES and CERCLA) and the annual monitoring results are not addressed in this document. However for information purposes, the maximum mercury concentration reported for over 200 samples collected during CY 2007 from Station 17 (0.001572 mg/L) does not exceed the MCL (0.002 mg/L). Station 17 is located in UEFPC on the south side of Bear Creek Road (Figure 13).

4.2.3 Chestnut Ridge Regime

The CY 2007 monitoring results reported for the springs and surface water sampling stations listed below in Table 26 serve as the exit pathway/perimeter monitoring locations in the Chestnut Ridge Regime.

Table 26. Chestnut Ridge Regime CY 2007: sampling locations used for exit pathway/perimeter monitoring

Groundwater		Surface Water	
SCR1.25SP	SCR3.5SP	SCR1.5SW	MCK 2.0
SCR2.1SP	SCR4.3SP	SCR3.5SW	MCK 2.05
SCR2.2SP		S17	

4.2.3.1 Groundwater

The springs used for exit pathway/perimeter monitoring in the Chestnut Ridge Regime are located in four of the primary surface drainage features that traverse the southern flank of Chestnut Ridge, exit the ORR, and discharge into the Melton Hill Lake south of Bethel Valley Road (Figure A.17). The CY 2007 monitoring results for these springs are consistent with respective historical data and show that the springs discharge uncontaminated calcium-magnesium-bicarbonate groundwater characterized by a wide range of calcium:magnesium ratios; variable but generally low molar proportions (<10%) of chloride, potassium, sodium, and sulfate; and low concentrations of several trace metals, notably barium, iron, manganese, and strontium. Results for nitrate and uranium are either non-detect values or within the range of background levels in the Chestnut Ridge Regime. Also, excluding trace levels (<3 µg/L) of MC (suspected analytical artifacts), VOCs were not detected in the groundwater samples collected from the springs. Gross alpha or gross beta activity above the associated MDA was reported for at least one sample from springs SCR2.2SP and SCR4.3SP, but each of these results are low values (<4 pCi/L) indicative of natural background radiation. These results indicate that operations at Y-12 do not appear to have impacted the quality of groundwater discharged from natural springs located in the surface drainage features that traverse the Chestnut Ridge Regime.

4.2.3.2 Surface Water

The surface water sampling stations used for exit pathway/perimeter monitoring in the Chestnut Ridge Regime during CY 2007 are located in Dunaway Branch (SCR1.5SW) at the western boundary of the regime; in McCoy Branch downstream of the FCAP (MCK 2.05 and MCK 2.0) and upstream of Rogers Quarry (SCR3.5SW); and in tributary SCR5 downstream of KHQ (S17) near the southeastern boundary of the regime (Figure A.17).

Analytical results for the surface water samples collected from McCoy Branch during CY 2007 indicate contamination immediately downstream of the FCAP at MCK 2.0 and MCK 2.05. These surface water sampling stations are located upstream (MCK 2.05) and downstream (MCK 2.0) of the FCAP Discharge Treatment Wetland, which was constructed as part of the CERCLA remedial action specified in the ROD for the site (DOE 1996). Samples from MCK 2.05 are representative of FCAP "influent" to the wetland and samples from MCK 2.0 are representative of "effluent" from the wetland (DOE 2002). Historical data show that the surface water samples from both locations are distinguished by elevated concentrations of sulfate and arsenic. Sulfate concentrations in the samples collected from both sampling locations during CY 2007 exceed background levels, with the highest concentrations reported for samples collected from MCK 2.05 (20.8 mg/L) and MCK 2.0 (27.8 mg/L) in January 2007 (seasonally high flow conditions). The monitoring results obtained during CY 2007 show that the maximum arsenic concentration at MCK 2.05 (0.0716 mg/L) and MCK 2.0 (0.0161 mg/L) and are above the drinking water MCL (0.01 mg/L) and were reported for the samples collected from both locations in July 2007 (seasonally low flow conditions). Notably, a much lower sulfate concentration (12.3 mg/L) and a trace of arsenic (0.00533 mg/L) was detected in the sample collected in May 2007 from surface water station SCR3.5SW, located about 2,000 ft downstream from MCK 2.0. Nevertheless, the elevated arsenic and sulfate levels reported for samples from MCK 2.0 and MCK 2.05 show continued impacts on surface water quality in upper McCoy Branch near the FCAP.

The CY 2007 monitoring results for surface water stations located in the other drainage features in the Chestnut Ridge Regime show non-detect values or background levels of nitrate and uranium. Similarly, VOCs were not detected in the samples collected from these surface water stations. Gross alpha activity and gross beta activity for these samples were below the associated MDAs, except for the beta activity (24 ± 4.4 pCi/L) reported for sample collected from station SCR3.5SW in May 2007. However, this is the first detection of beta activity at this location, and the result is a suspected outlier. Historical and current waste management operations do not appear to have significantly affected surface-water quality in these drainage features.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The groundwater and surface water quality data obtained during CY 2007 are generally consistent with: (1) the presence of the principal Y-12 groundwater contaminants from known and suspected source areas in the Bear Creek Regime, East Fork Regime, and Chestnut Ridge Regime; (2) the types of contaminants from respective source areas in each regime and the overall pattern and extent of contaminant transport in each regime; and (3) the long-term contaminant concentration trends evident for the respective groundwater and surface water sampling locations in each regime. This report includes monitoring results for 238 sampling locations: 208 monitoring wells, 10 springs, and 20 surface water stations.

The CY 2007 monitoring results reported for 67 wells (40 aquitard wells and 27 aquifer wells) meet the surveillance monitoring requirements in the Bear Creek Regime. Groundwater samples from 22 of the aquitard wells and 22 of the aquifer wells had elevated concentrations of one or more of the principal contaminants at Y-12, with the highest concentrations reported for samples from wells located near the former S-3 Ponds, the former BYBY/HCDA, and the BCBG WMA. Analytical results for most these wells do not indicate any significant change in the overall extent of groundwater contamination in the Bear Creek Regime or the relative distribution of contaminants from the primary source areas. The VOC concentrations reported during CY 2007 (>20,000 µg/L) for aquitard well GW-629 (located at the BCBG WMA) confirm the results reported in CY 2006, and are significantly higher than in samples collected from the well in CY 1997 and CY 1998 (<10 µg/L).

The CY 2007 exit pathway/perimeter monitoring in the Bear Creek Regime is reported for 9 surface water stations along Bear Creek (including six northern tributaries), three springs that discharge into Bear Creek, and three aquifer wells at the westernmost Exit Pathway Picket (Picket W). None of the groundwater samples from the Picket W wells had elevated concentrations of the principal groundwater contaminants at Y-12, but elevated concentrations of one or more of the contaminants were detected in surface water samples from sampling stations in four tributaries (NT-1, NT-4, NT-7, and NT-8) and two springs (SS-4 and SS-5). These results are generally consistent with historical data and show that contaminant concentrations in Bear Creek decrease with distance from each of the principal source areas (the S-3 Site, BYBY/HCDA, and BCBG WMA), including inflow of contaminated water from the northern tributaries of the creek that drain these sites. At station BCK-04.55, which is located where Bear Creek turns north at the westernmost extent of the Bear Creek Regime, the CY 2007 concentrations of all principal contaminants were below applicable screening levels.

The CY 2007 monitoring results for applicable surveillance and exit-pathway/perimeter sampling locations in the Bear Creek Regime continue the long-term contaminant concentration trends indicated by historical data for each applicable sampling location. Increasing concentrations are evident for at least one principal contaminant detected in samples from 10 wells (nine aquitard and one aquifer) and one surface water station, located near the S-3 Site (three wells and the surface water station), the OLF WMA (two wells), and the BCBG WMA (five wells). Decreasing or indeterminate (not increasing or decreasing) trends are evident for contaminants detected in samples from 39 wells, four surface water stations, and two springs. Monitoring wells with elevated concentrations of more than one principal contaminant commonly have different trends for each contaminant (e.g., increasing nitrate trend and decreasing or indeterminate VOC trend), which reflects different sources and/or transport flowpaths for the different contaminants.

The CY 2007 monitoring results reported for 54 aquitard wells and 30 aquifer wells (including five wells located in Union Valley east of the ORR boundary along Scarboro Road) meet the requirements of surveillance monitoring in the East Fork Regime. Groundwater samples from 40 of the aquitard wells and 22 of the aquifer wells had elevated concentrations of one or more of the principal contaminants at Y-12. The highest inorganic and radiological contaminant concentrations were reported for samples from aquitard wells located in a portion of the western Y-12 area impacted by the contaminant plume emplaced during historical operations of the former S-3 Ponds. Extremely high (>70,000 µg/L) VOC concentrations (indicative of nearby DNAPL) were observed in the groundwater near Building 9201-5, and very high (>1,000 µg/L) VOC concentrations were reported for wells near the Y-12 Salvage Yard, the WCPA, and a former UST locations (East End Garage). Aquifer wells with the highest contaminant concentrations are located immediately downgradient (east) of the former S-2 Ponds in the western Y-12 area, within the co-mingled VOC plume from multiple sources in the central Y-12 area, and in the eastern Y-12 area near NHP/Lake Reality and Oil Skimmer Basin. Analytical results for these wells do not indicate any significant change in the overall extent of groundwater contamination in the East Fork Regime or the relative distribution of contaminants from the primary source areas.

The CY 2007 monitoring results reported for 16 sampling locations (one surface water station in the central Y-12 area, 10 monitoring wells and one surface water station in the eastern Y-12 area, and four surface water stations located north of Pine Ridge along the border of the ORR) meet the requirements of exit-pathway/perimeter monitoring for the East Fork Regime. Elevated concentrations of one or more of the principal groundwater contaminants at Y-12, primarily VOCs, were reported for at least one of the groundwater/surface water samples from five of the wells and two of the surface water sampling stations. Sampling results for some of the wells exhibit a direct response (i.e., lower VOC concentrations) to the operation of the groundwater extraction well used to help capture the plume and deter continued migration of VOCs into Union Valley. Analytical results for the surface water sampling stations suggest that the concentrations of the principal groundwater contaminants (primarily uranium) reflect the continued impact of legacy Y-12 operations on the quality of surface water in UEFPC upstream of the ORR boundary. Note that mercury is a primary concern in the surface water of the East Fork Regime and results of flow-proportionate sampling performed under other monitoring programs are not addressed in this report. Because of low solubility, mercury is rarely detected in groundwater samples and is not considered to be a groundwater contaminant.

The CY 2007 monitoring results for applicable surveillance and exit-pathway/perimeter sampling locations in the East Fork Regime continue the long-term contaminant concentration trends indicated by historical data for each applicable sampling location. Increasing concentrations are evident for at least one of the principal contaminants detected in samples from 17 wells, and decreasing or indeterminate (not increasing or decreasing) concentration trends are evident for contaminants detected in samples from 61 wells and two surface water stations. Monitoring wells with elevated concentrations of more than one principal contaminant commonly have different trends for each contaminant (e.g., increasing nitrate trend and decreasing or indeterminate VOC trend), which reflects different sources and/or transport flowpaths for the different contaminants.

The CY 2007 sampling results for 47 wells located on Chestnut Ridge meet the requirements of surveillance monitoring in the Chestnut Ridge Regime. Results indicative of legacy contamination associated with former operations at Y-12 were reported for well GW-305 at Industrial Landfill IV, well GW-544 at CDL VI, and eight wells near the CRSP. These wells each yield VOC-contaminated groundwater, with concentrations above applicable drinking water MCLs reported for PCE and 11DCE detected in the samples from well GW-305 and five wells at the CRSP. Analytical results for these wells do not indicate any significant change in the overall extent of VOC-contaminated groundwater in the regime or the relative distribution of contaminants. Additionally, the CY 2007 sampling results continue the VOC concentration trends indicated by historical data for the wells at the CRSP; are consistent with the recent trends evident since the initial detection of VOCs in well GW-305; and suggest that VOC concentrations in groundwater at well GW-544 and GW-798 have decreased from the historical peaks evident in January 2004 and January 2003, respectively.

The CY 2007 monitoring results reported for five natural springs and five sampling stations located in major drainage features that traverse the southern flank of Chestnut Ridge meet the requirements of exit-pathway/perimeter monitoring in the Chestnut Ridge Regime. The principal groundwater contaminants at Y-12 were either not detected in the samples from each spring and surface water station, or were detected at concentrations within the range of background levels in the regime. However, the CY 2007 sampling results for sampling stations in McCoy Branch show elevated concentrations of arsenic (>0.01 mg/L) and sulfate (>20 mg/L) immediately downstream of the FCAP, but not farther downstream where this drainage feature exits the ORR.

Based on groundwater and surface water monitoring data obtained in the Bear Creek Regime, East Fork Regime, and Chestnut Ridge Regime during CY 2007, the following actions are recommended:

- Well GW-170 in Union Valley and well GW-205 in the Chestnut Ridge Regime should be redeveloped to attempt to reduce the apparent grout contamination in each well. Also, in order to ensure collection of the most representative (i.e., least grout-contaminated) groundwater samples from these wells, the conventional sampling method should be considered or, if the low-flow sampling method is used, each well should be purged until the pH is below 9 before the groundwater samples are obtained.

- Analyze for Tc-99 activity at well 55-2B to evaluate the potentially increasing trend in gross beta activity in samples from the well. The elevated gross beta activity reported during CY 2007 was considered an outlier, but increasing nitrate concentrations in samples from the well suggest transport from the S-3 Site.

The following actions are recommended to improve monitoring efficiency, and could be incorporated into the GWPP SAP for CY 2009:

- Evaluate the sampling frequency recommendations for each monitoring well provided by an updated assessment of the Y-12 GWPP groundwater monitoring program. This assessment, using the Monitoring and Remediation Optimization Software, is being performed during CY 2008. After a final review of the recommendations, the revised sampling frequency (e.g., semiannual, annual, or biennial) should be assigned to each monitoring well.

- Applicable analytical parameters could be selected for each location, instead of analyzing for the Standard Administrative Parameter Group at every well. Based on an evaluation of historical data and intended use of wells (e.g., long-term trending), specific analytes could be chosen for each monitoring location that meet the requirements of the Y-12 GWPP monitoring program. For example, samples from many of the wells near the BCBG WMA could be analyzed solely for VOCs. The extensive historic data for these wells show that other primary contaminants are not constituents of concern.

- A passive sampling method (e.g., Hydrasleeve® samplers) should be evaluated for selected monitoring wells. It is recommended that a comparison of results obtained using this alternative sampling method to results obtained using the low-flow sampling method by collecting "paired" samples from several wells. If results for the paired samples are favorably comparable, then implementation of the new method could be phased in at appropriate monitoring wells.

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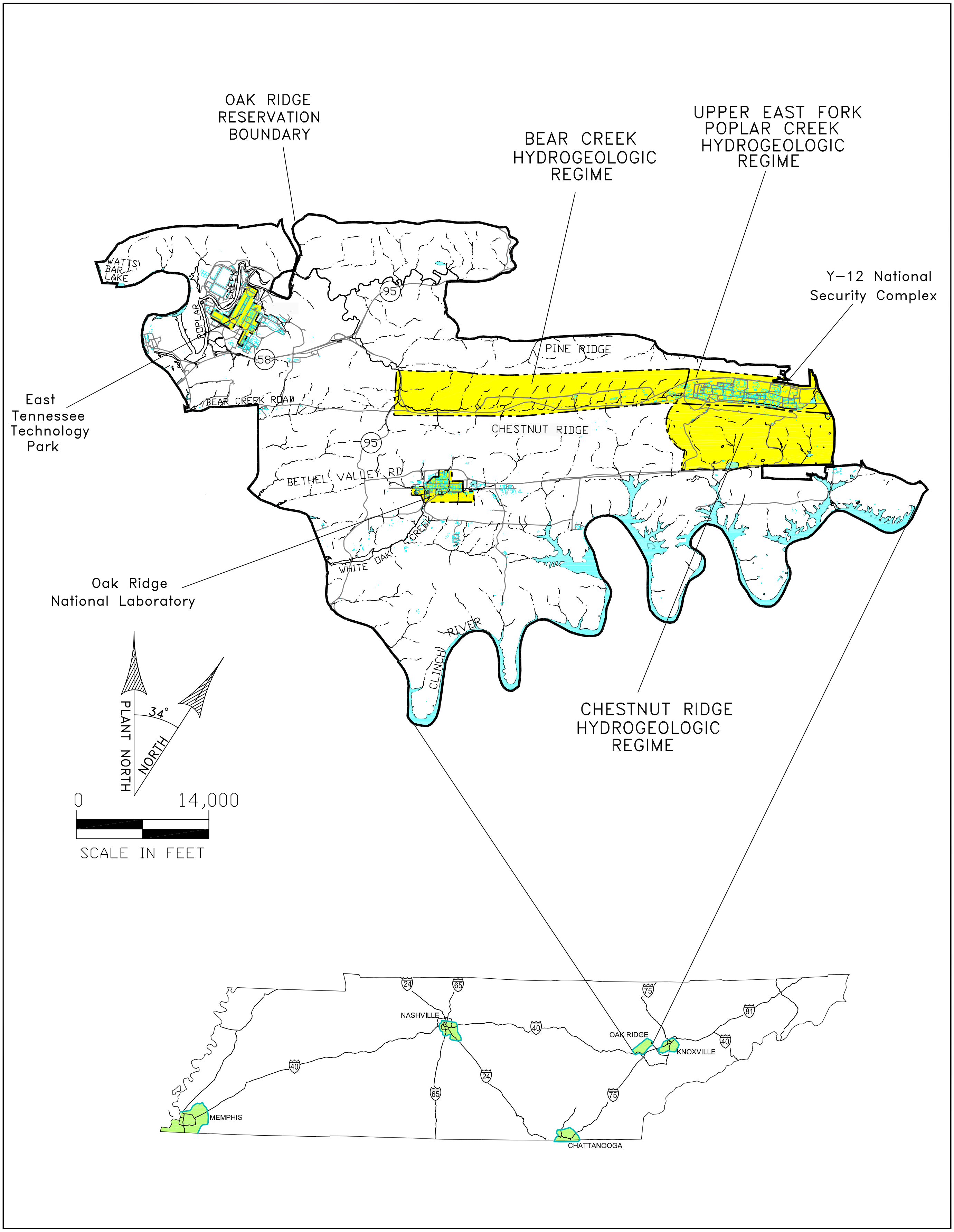
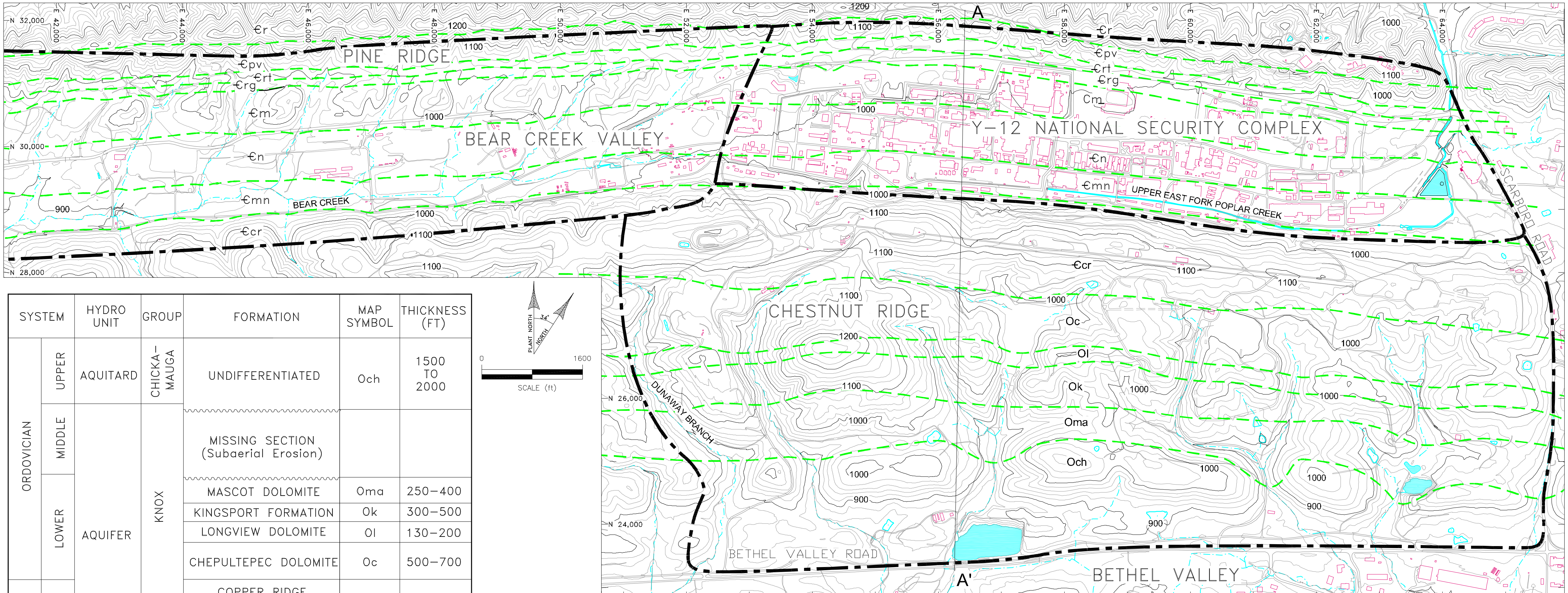
APPENDIX A

FIGURES



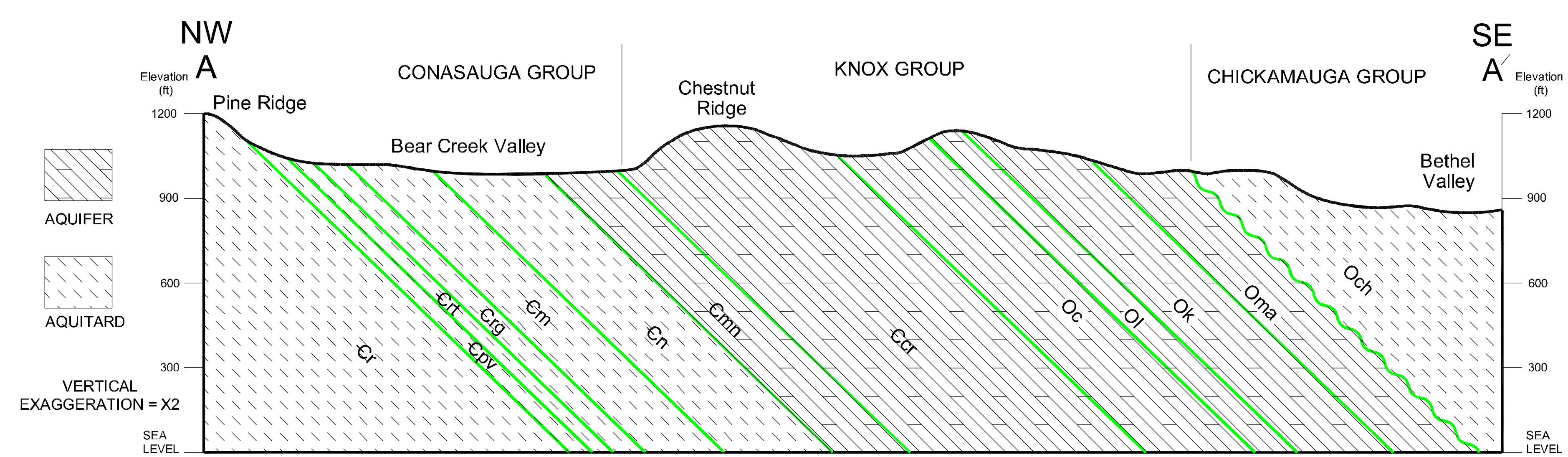
GWPP Fig1 09/23/08

Fig. A.1. Hydrogeologic regimes at the Y-12 National Security Complex.



SYSTEM		HYDRO UNIT	GROUP	FORMATION	MAP SYMBOL	THICKNESS (FT)
ORDOVICIAN	UPPER	AQUITARD	CHICKAMAUGA	UNDIFFERENTIATED	Och	1500 TO 2000
ORDOVICIAN	MIDDLE	AQUIFER	KNOX	MISSING SECTION (Subaerial Erosion)		
ORDOVICIAN	LOWER	AQUIFER	KNOX	MASCOT DOLOMITE	Oma	250–400
				KINGSPORT FORMATION	Ok	300–500
				LONGVIEW DOLOMITE	Ol	130–200
				CHEPULTEPEC DOLOMITE	Oc	500–700
CAMBRIAN	UPPER	AQUIFER	KNOX	COPPER RIDGE DOLOMITE	Ꞓcr	800–1,100
			CONASAUGA	MAYNARDVILLE LIMESTONE	Ꞓmn	418–450
CAMBRIAN	MIDDLE	AQUITARD	CONASAUGA	NOLICHUCKY SHALE	Ꞓn	490–590
				MARYVILLE LIMESTONE	Ꞓm	346–445
				ROGERSVILLE SHALE	Ꞓrg	90–120
				RUTLEDGE LIMESTONE	Ꞓrt	90–120
				PUMPKIN VALLEY SHALE	Ꞓpv	260–320
CAMBRIAN	LOWER	AQUITARD		ROME	Ꞓr	NOT DETERMINED

SOURCES: King and Haas 1987
Hatcher et al. 1992

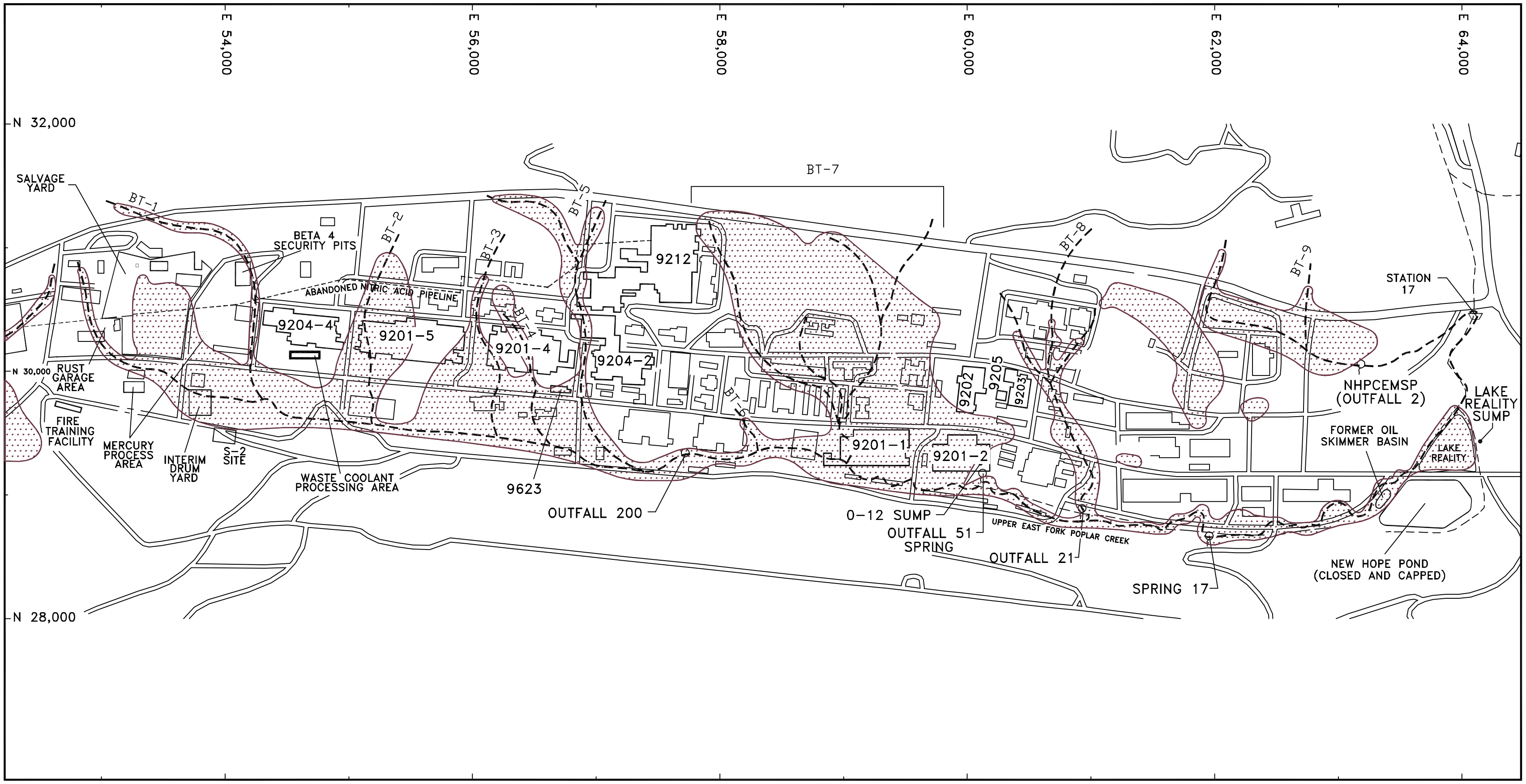


GENERALIZED GEOLOGIC CROSS SECTION

GWMR07_2 04/30/08

Fig. A.2. Topography and bedrock geology at the Y-12 National Security Complex.

GWMR07_03 01/10/08



SOURCE: Sutton and Field 1995

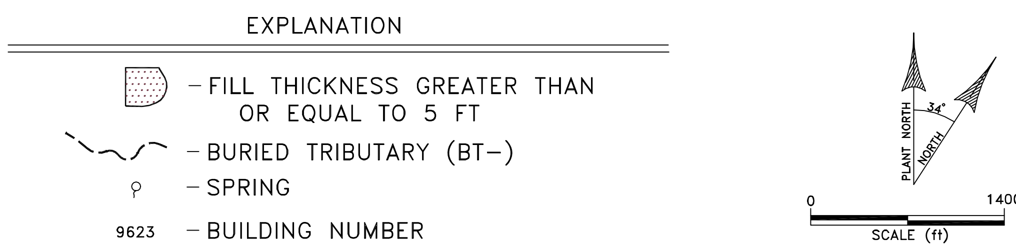
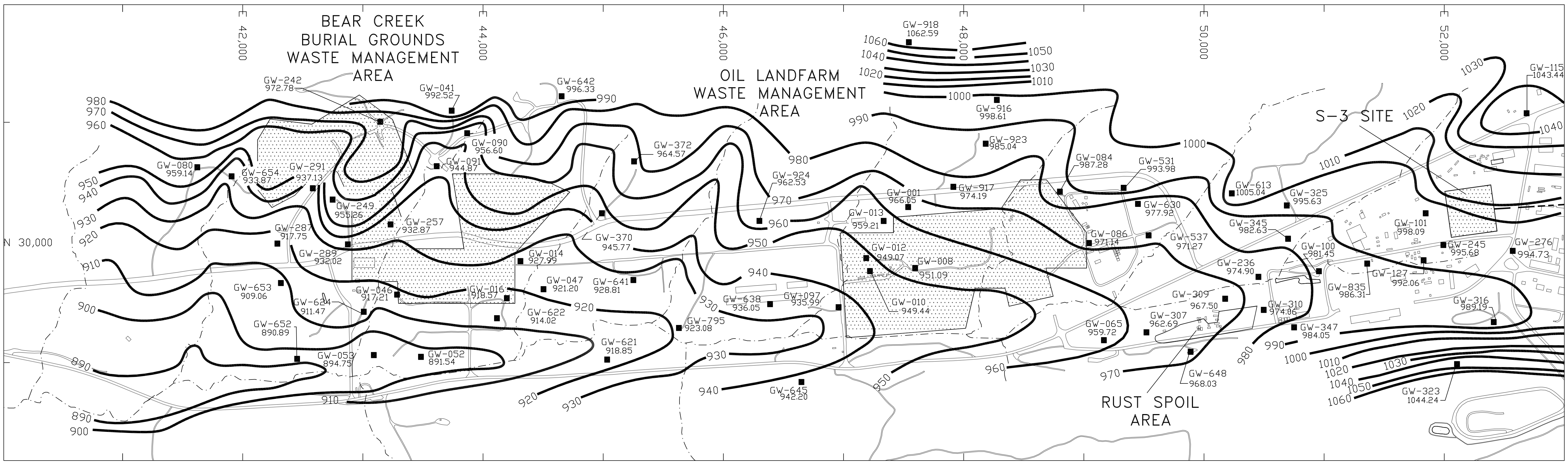
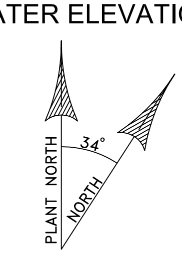
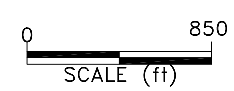


Fig. A.3. Fill areas and pre-construction drainage features in the Upper East Fork Poplar Creek Hydrogeologic Regime.



GROUNDWATER ELEVATIONS APRIL 9-17, 2007



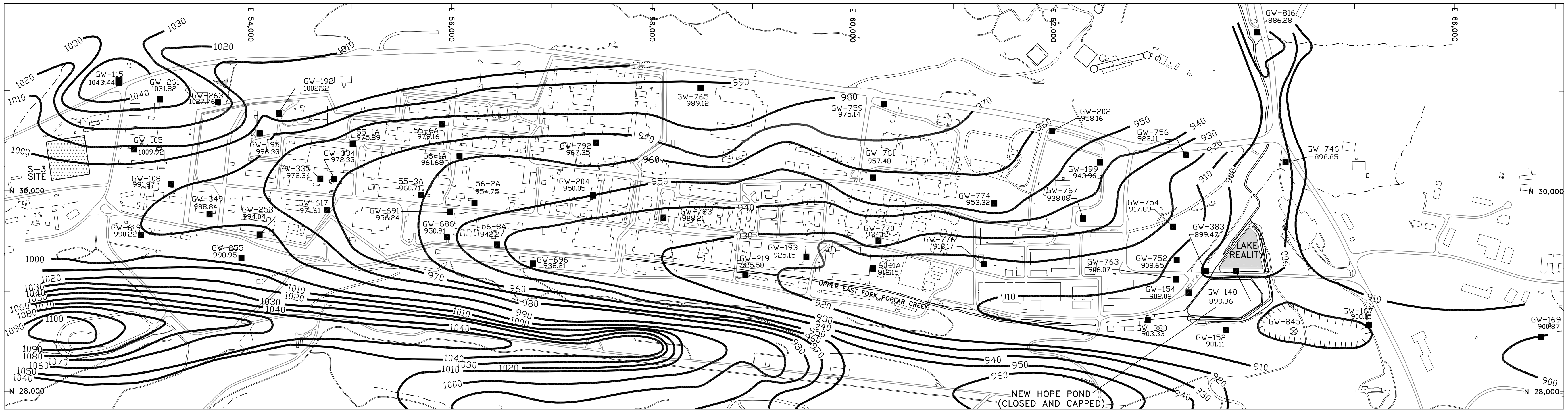


EXPLANATION

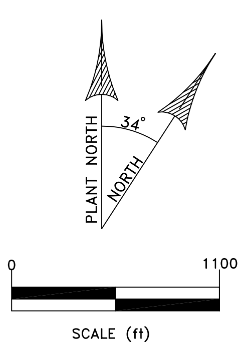
■ WATER TABLE INTERVAL MONITORING WELL	920 WATER-LEVEL ISOPLETH (ft msl)
	SURFACE DRAINAGE FEATURE

GWMR07_04 02/05/08

Fig. A.4. Groundwater elevations in the Bear Creek Hydrogeologic Regime, April 2007.



GROUNDWATER ELEVATIONS APRIL 9-12, 2007

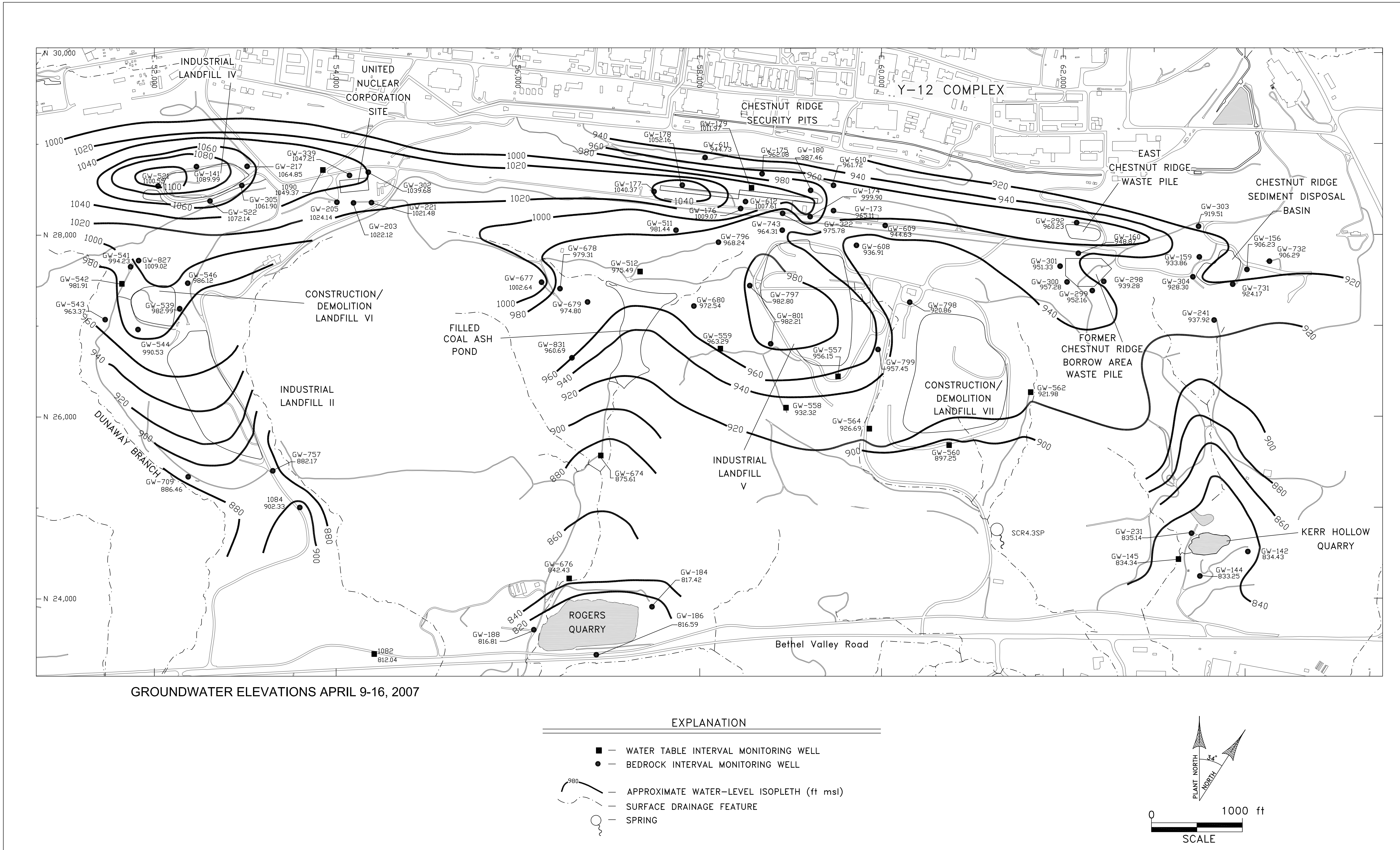


EXPLANATION

- WATER TABLE INTERVAL MONITORING WELL
- 980 — APPROXIMATE WATER-LEVEL ISOPLETH (ft msl)
- SURFACE DRAINAGE FEATURE
- BUILDING 9201-2 SUMP
- GW-845 — EXTRACTION WELL AND APPROXIMATE ZONE OF INFLUENCE

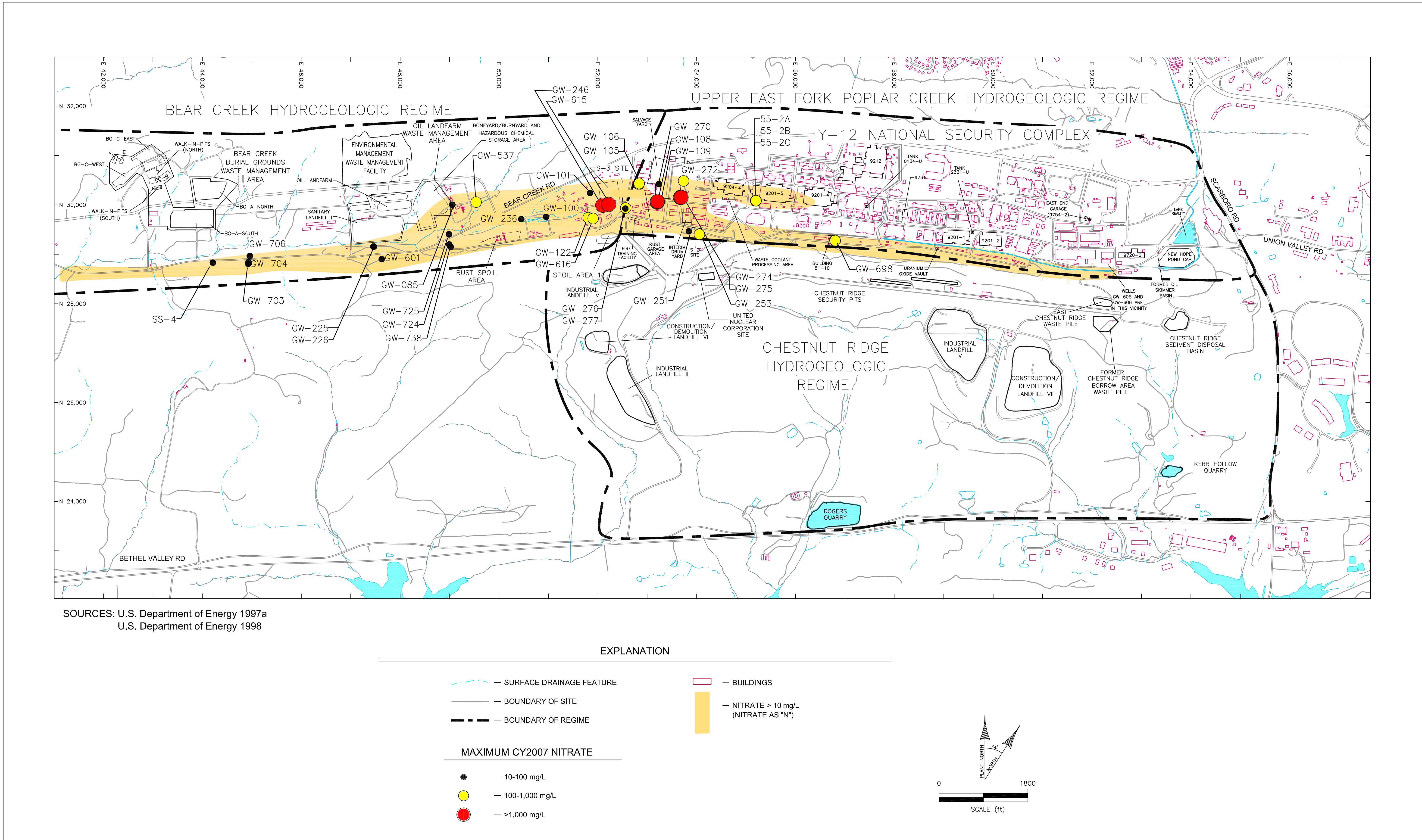
GWMR07_05 02/05/08

Fig. A.5. Groundwater elevations in the Upper East Fork Poplar Creek Hydrogeologic Regime, April 2007.



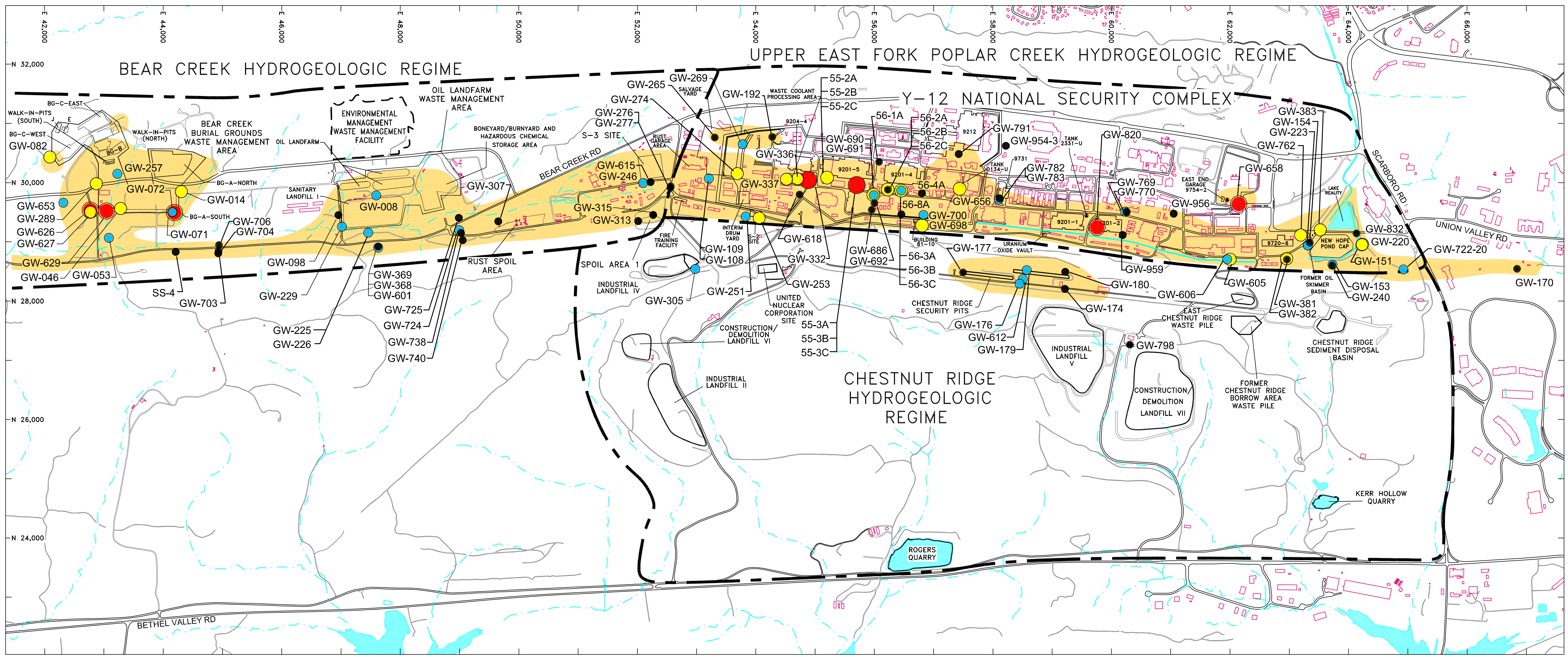
GWMR07_06 02/05/08

Fig. A.6. Groundwater elevations in the Chestnut Ridge Hydrogeologic Regime, April 2007.



GWMR07_07.DWG 05/15/08

Fig. A.7. Generalized extent of nitrate in groundwater at the Y-12 National Security Complex.



SOURCES: U.S. Department of Energy 1997a
U.S. Department of Energy 1998

EXPLANATION

— SURFACE DRAINAGE FEATURE
— BOUNDARY OF SITE
— BOUNDARY OF REGIME
— BUILDINGS
— SUMMED VOCs > 5 ug/L

MAXIMUM CY2007 SUMMED VOCs

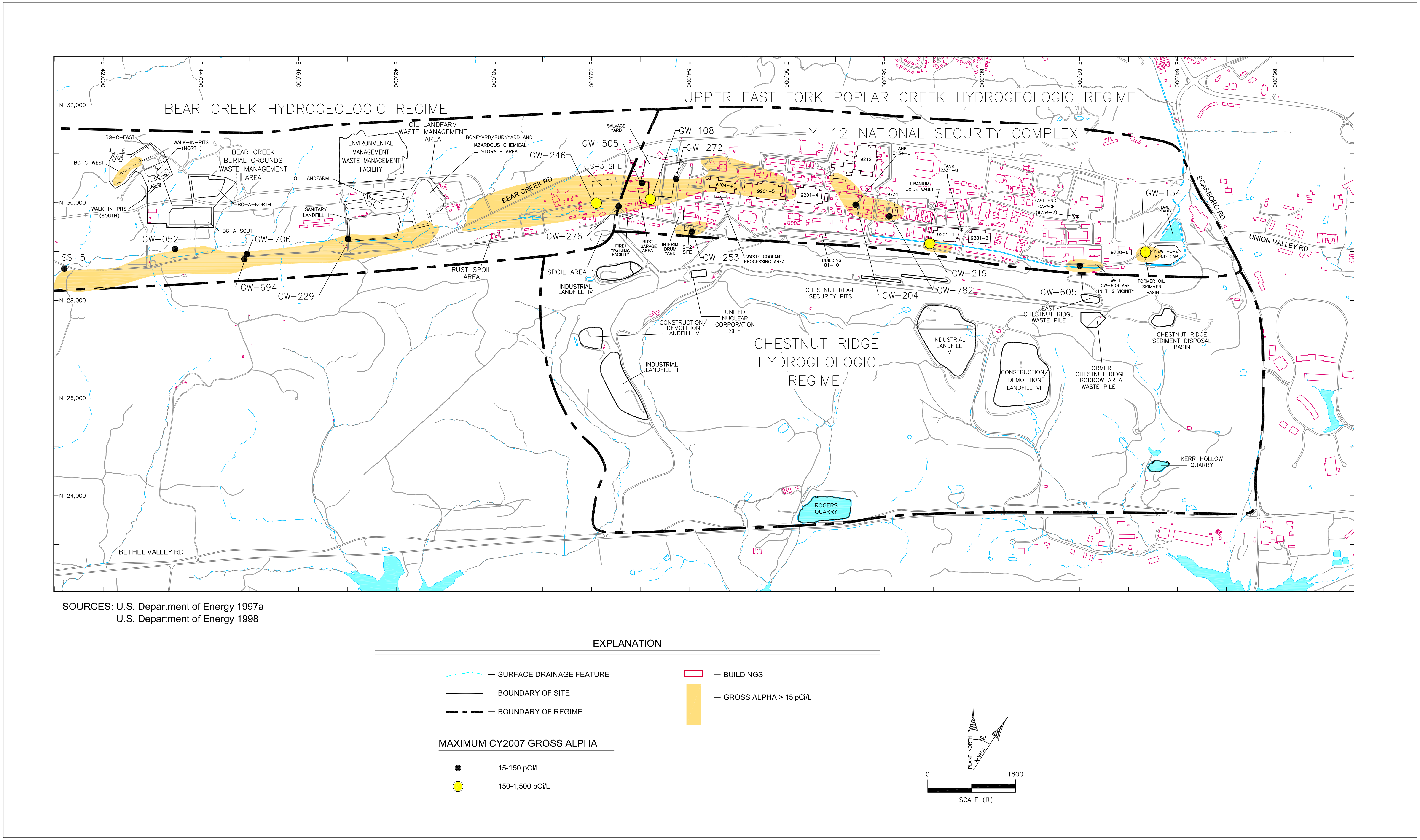
— 5-50 ug/L
— 50-500 ug/L
— 500-5,000 ug/L
— >5,000 ug/L

PLANT NORTH
34°
NORTH

0 1800
SCALE (ft)

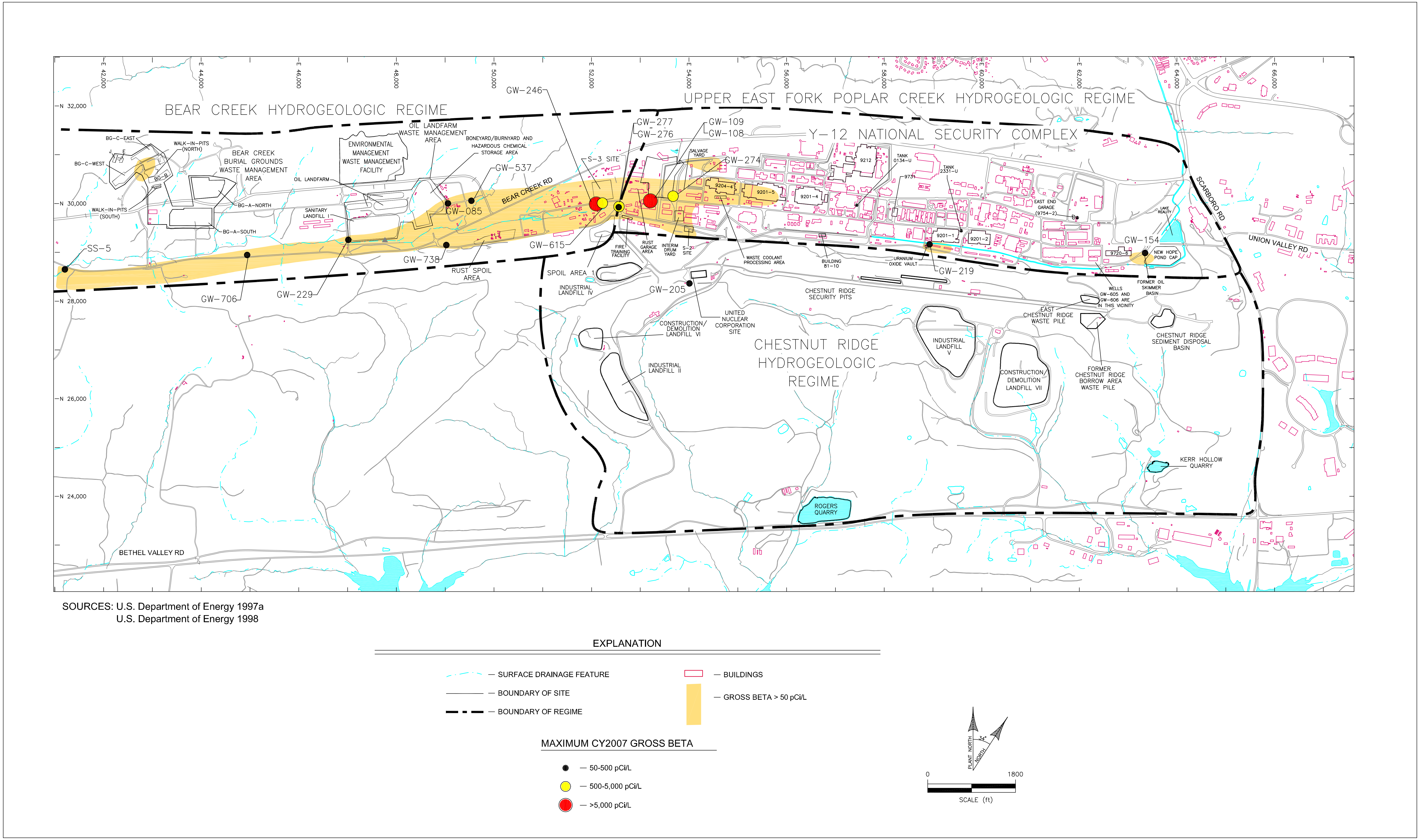
GWMR07_08 05/15/08

Fig. A.8. Generalized extent of volatile organic compounds in groundwater at the Y-12 National Security Complex.



GWMR07_09.DWG 05/15/08

Fig. A.9. Generalized extent of gross alpha activity in groundwater at the Y-12 National Security Complex.



GWMR07_10.DWG 04/30/08

Fig. A.10. Generalized extent of gross beta activity in groundwater at the Y-12 National Security Complex.

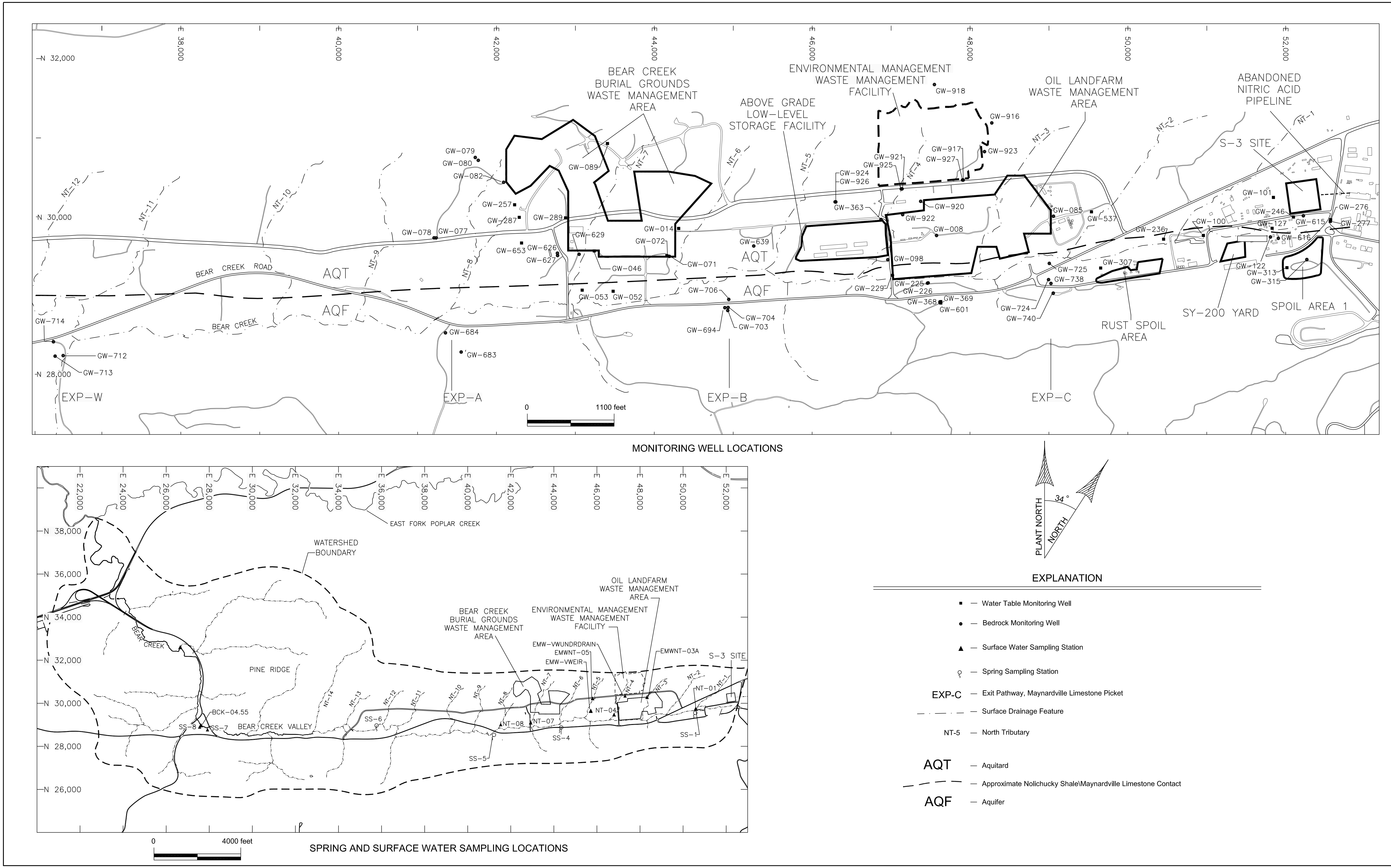
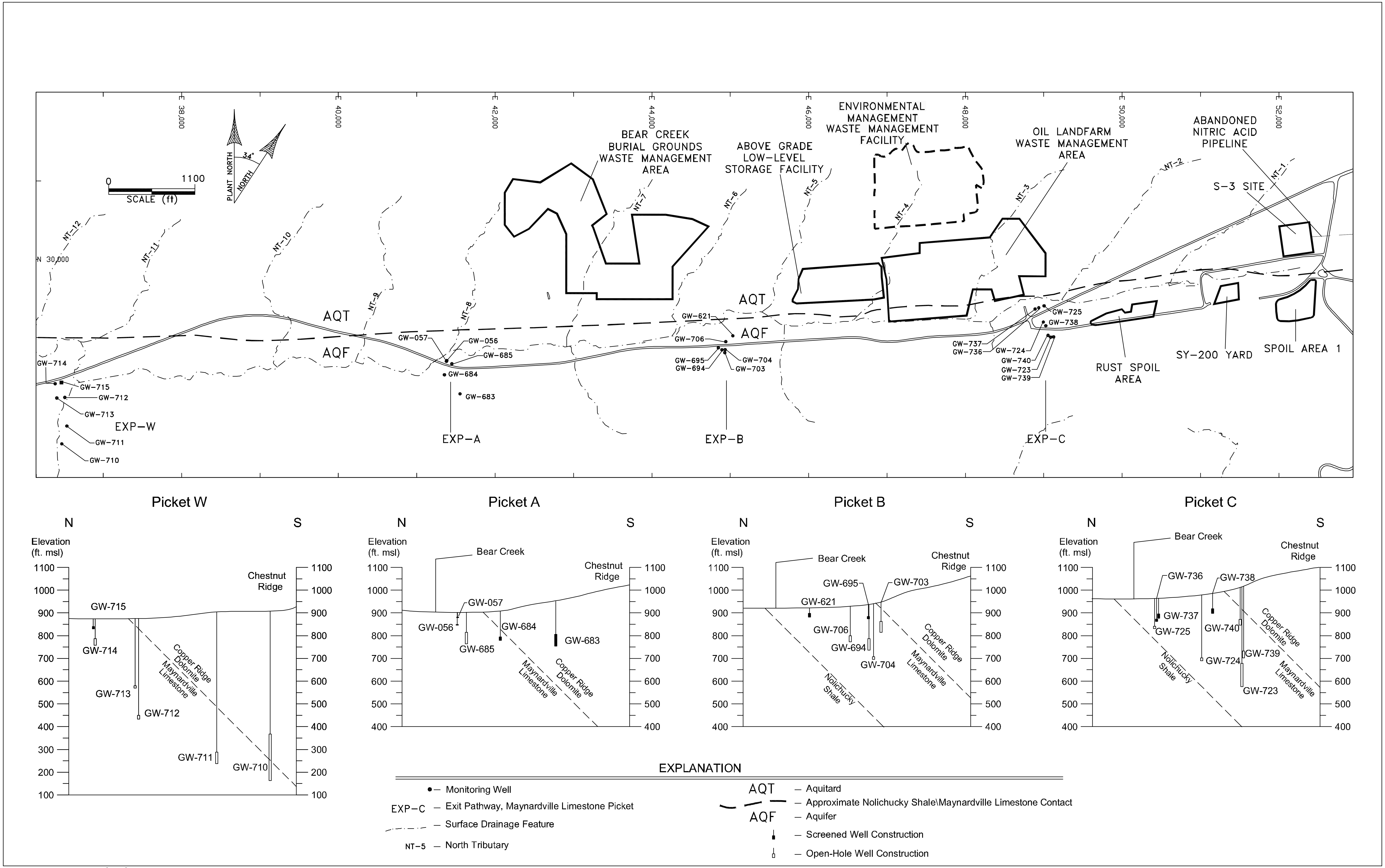
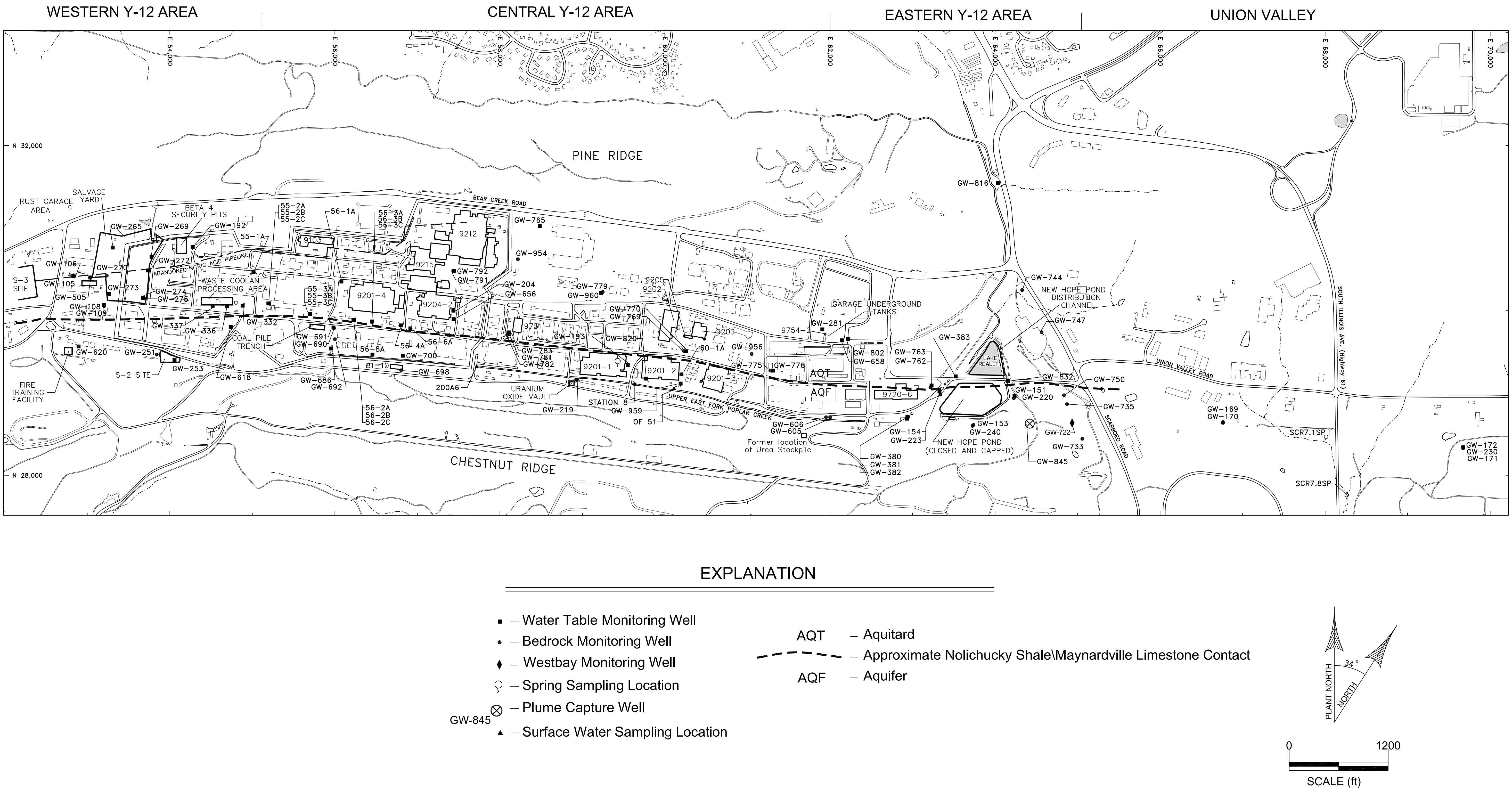


Fig. A.11. CY 2007 sampling locations in the Bear Creek Hydrogeologic Regime.



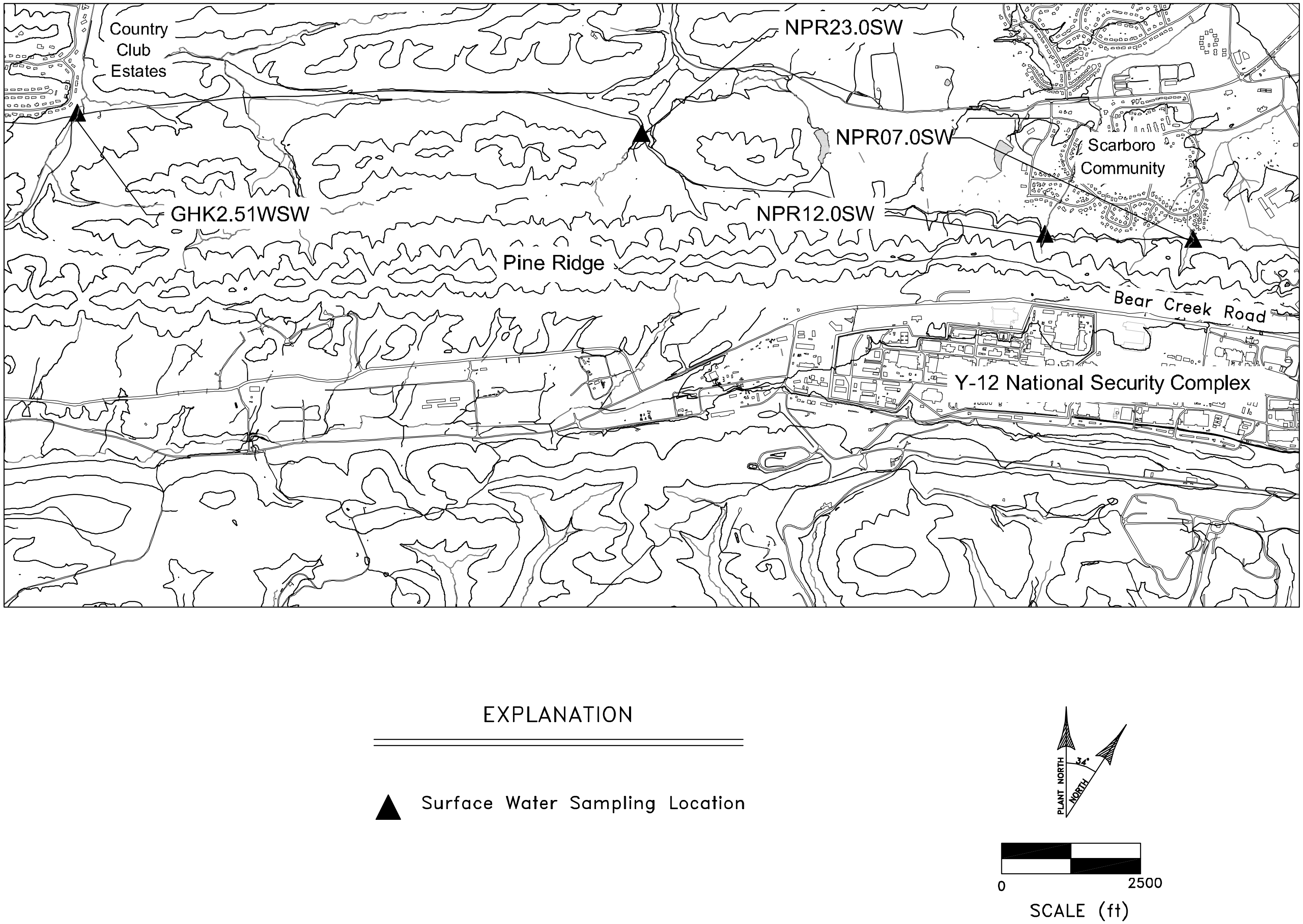
GWMR07_12 01/10/08

Fig. A.12. Components of Maynardville Limestone exit pathway pickets A, B, C, and W.



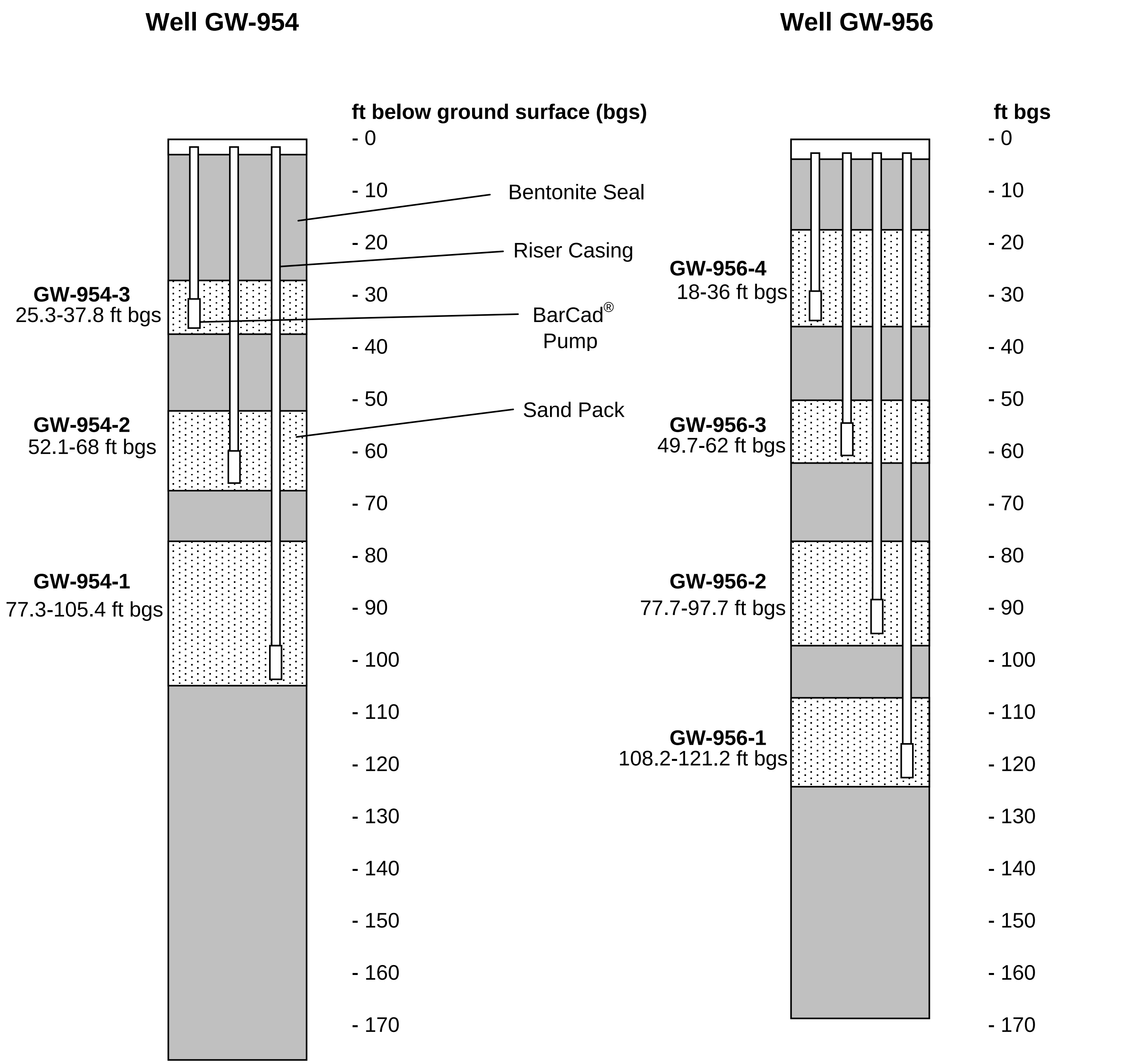
GWMR07_13 04/30/08

Fig. A.13. CY 2007 sampling locations in the Upper East Fork Poplar Creek Hydrogeologic Regime and in Union Valley.



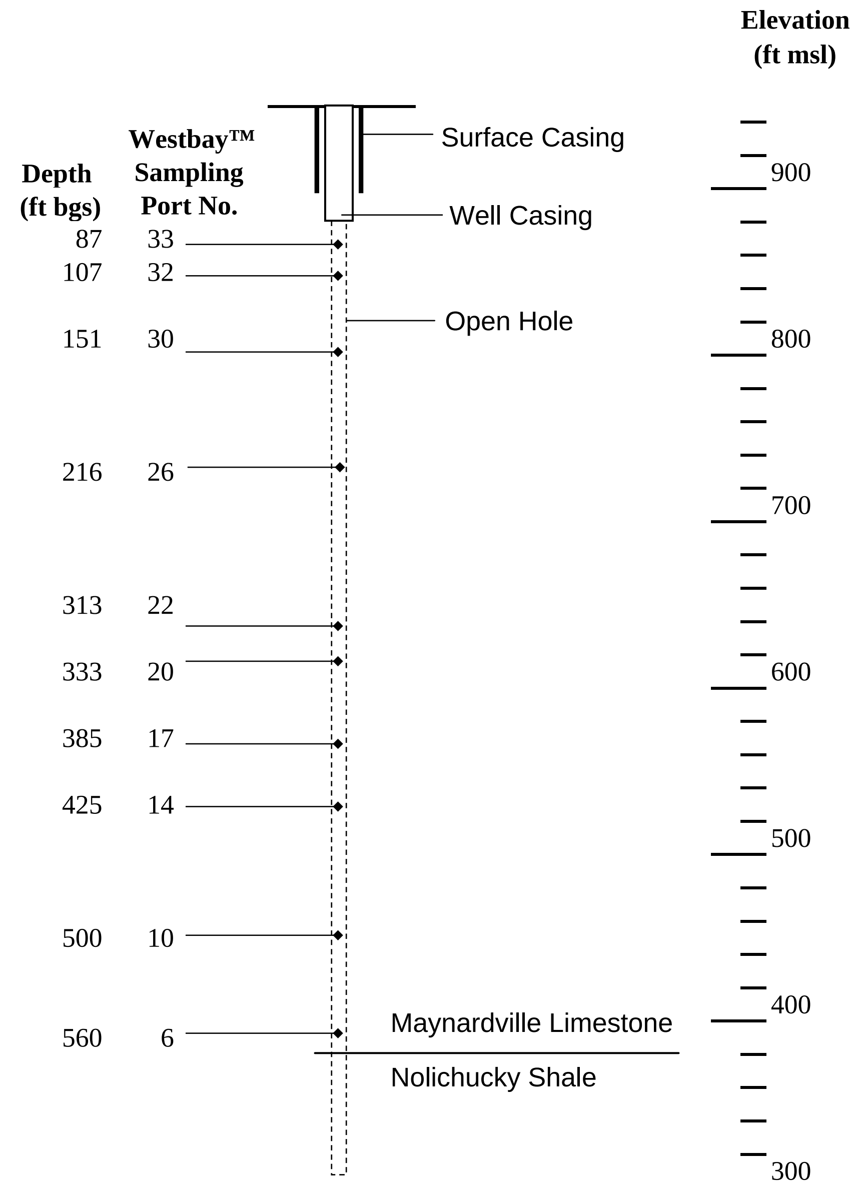
GWMR07_14 01/10/08

Fig. A.14. CY 2007 surface water sampling locations north of Pine Ridge.



GWMR07_15.xls

Fig. A.15. BarCad® pump system sampling depths in wells GW-954 and GW-956.



GWMR07_16.xls

Fig. A.16. Westbay™ monitoring system sampling port depths in well GW-722.

GWMR07_17 04/30/08

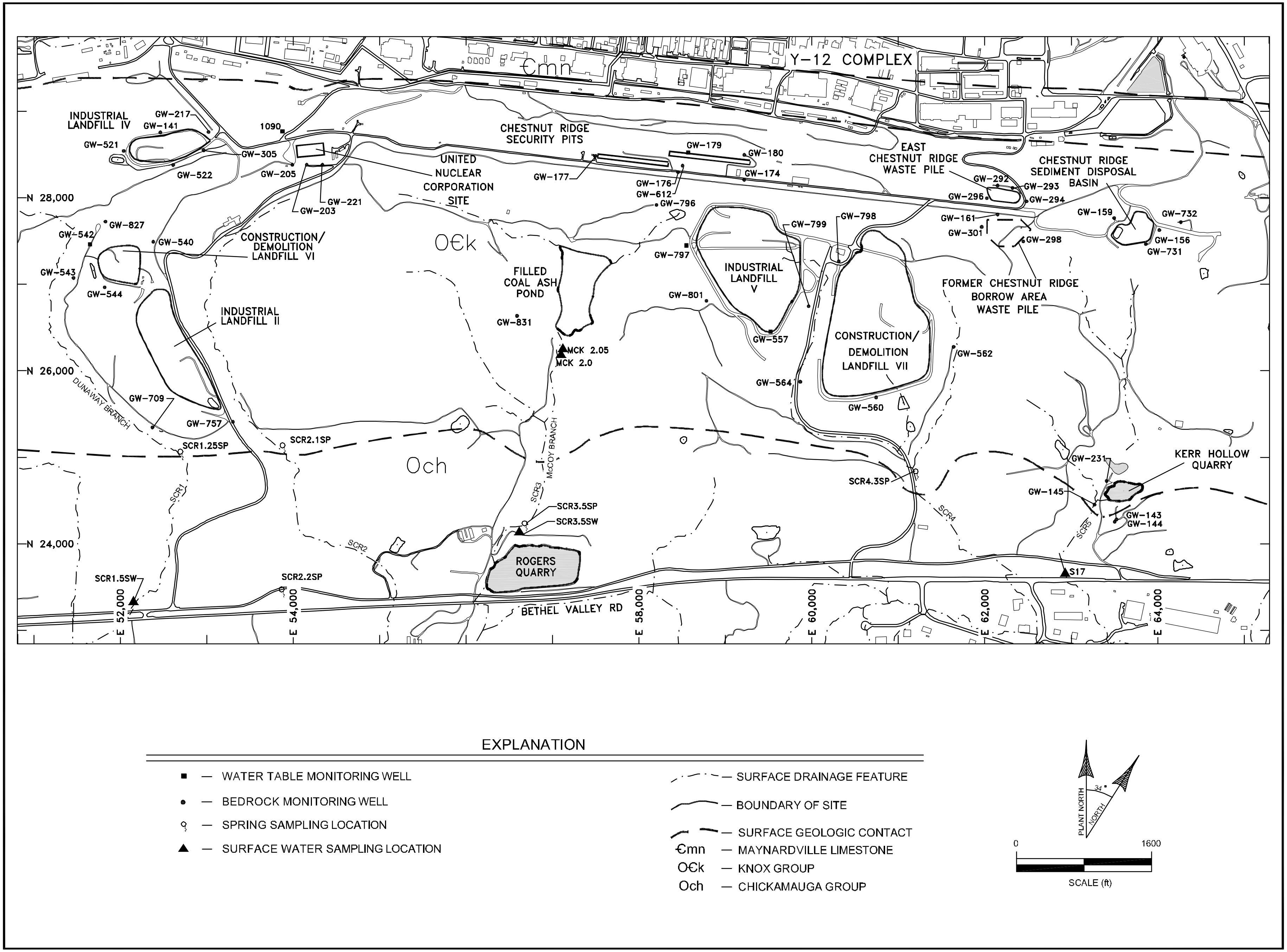
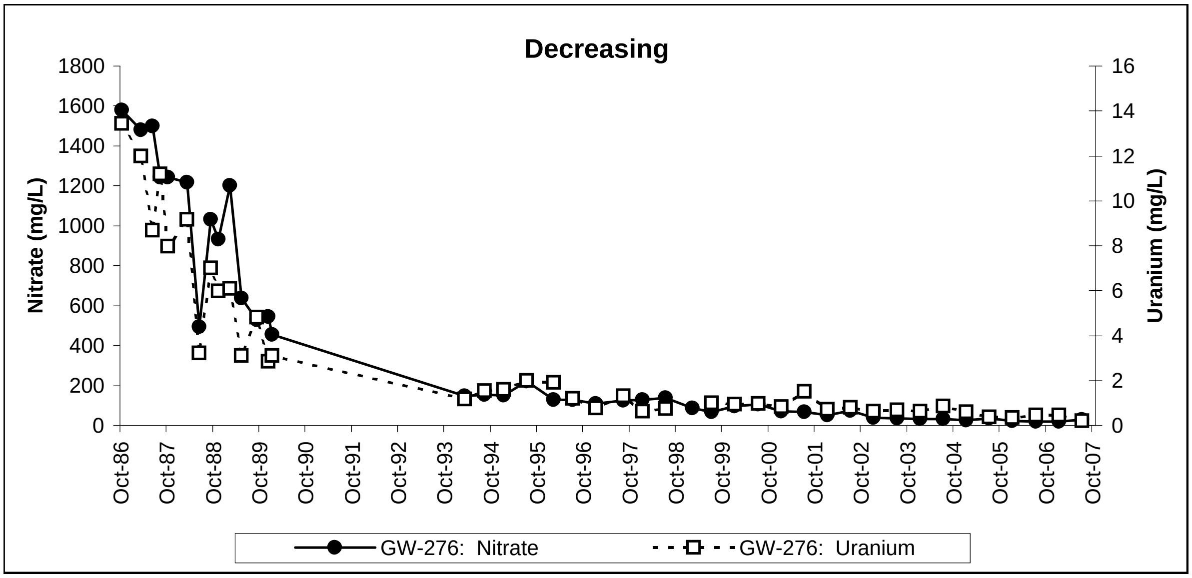
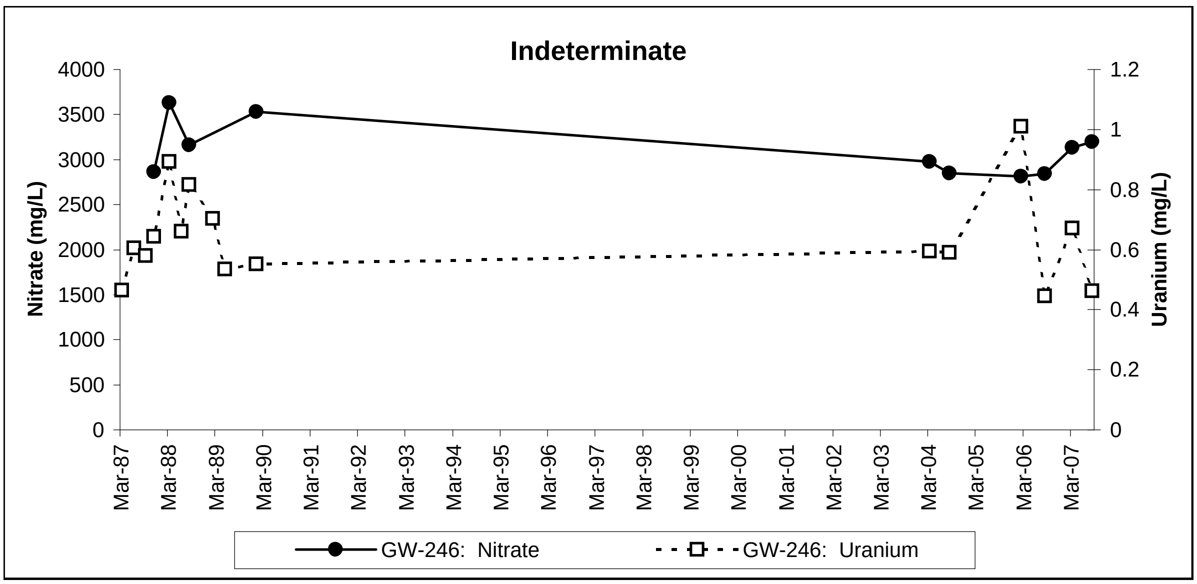
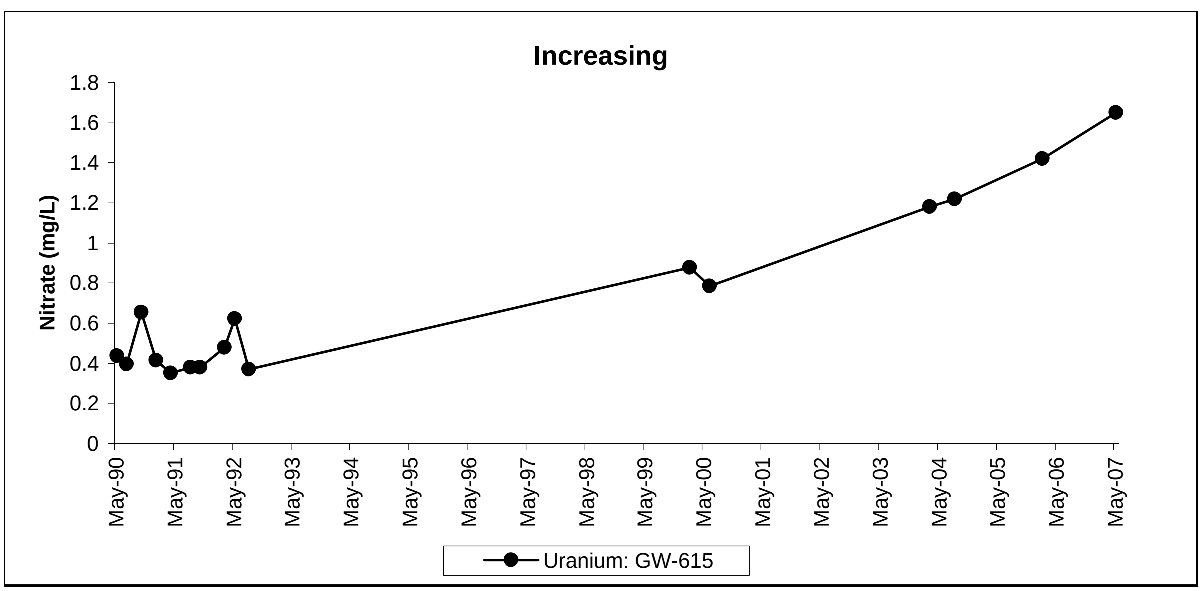


Fig. A.17. CY 2007 sampling locations in the Chestnut Ridge Hydrogeologic Regime.

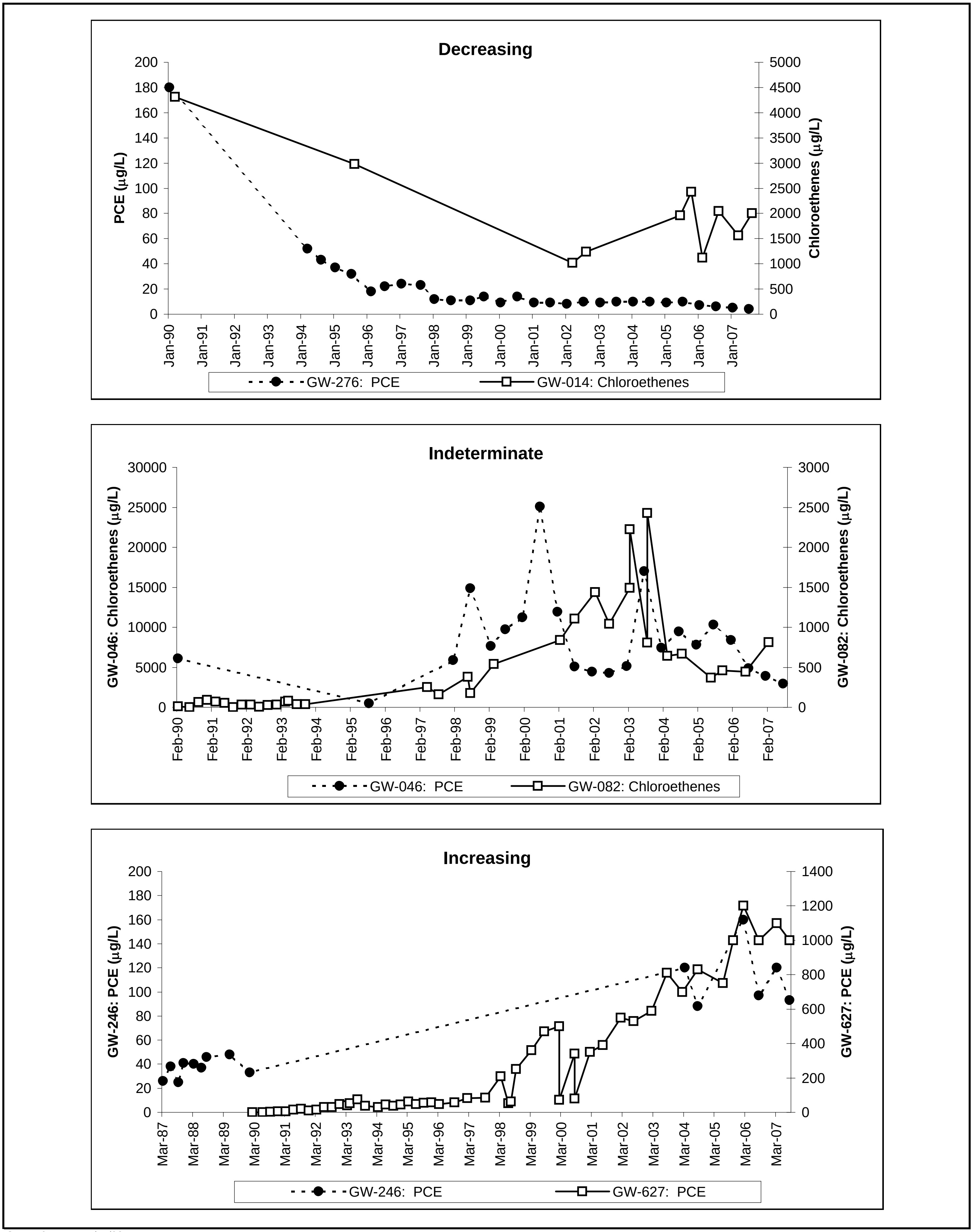






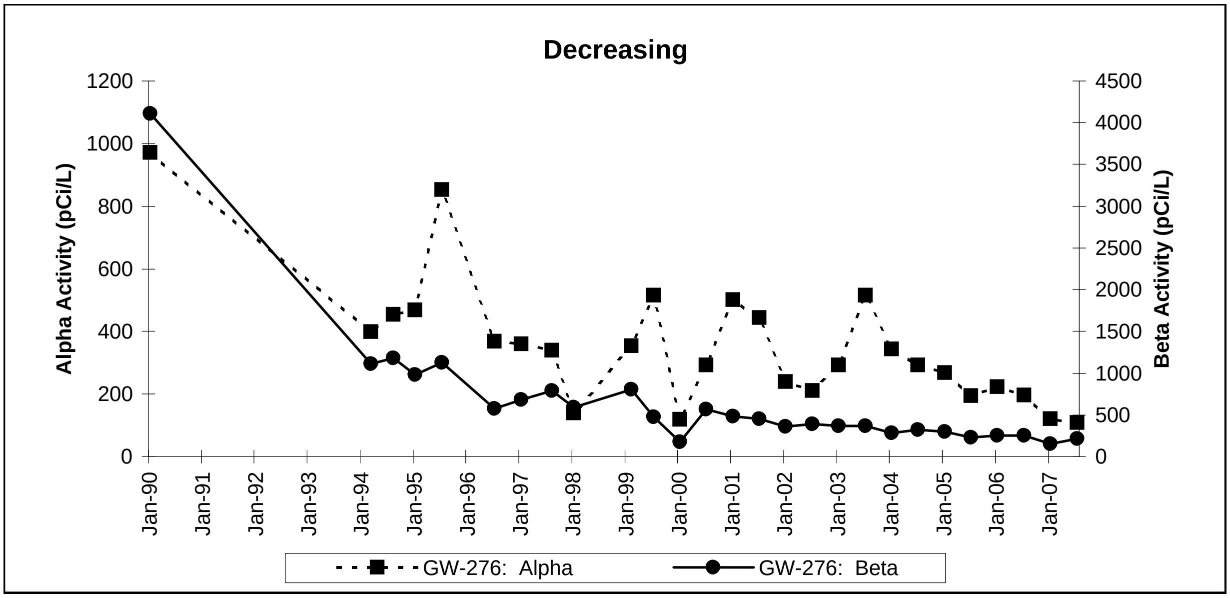
GWMR07 05/27/08

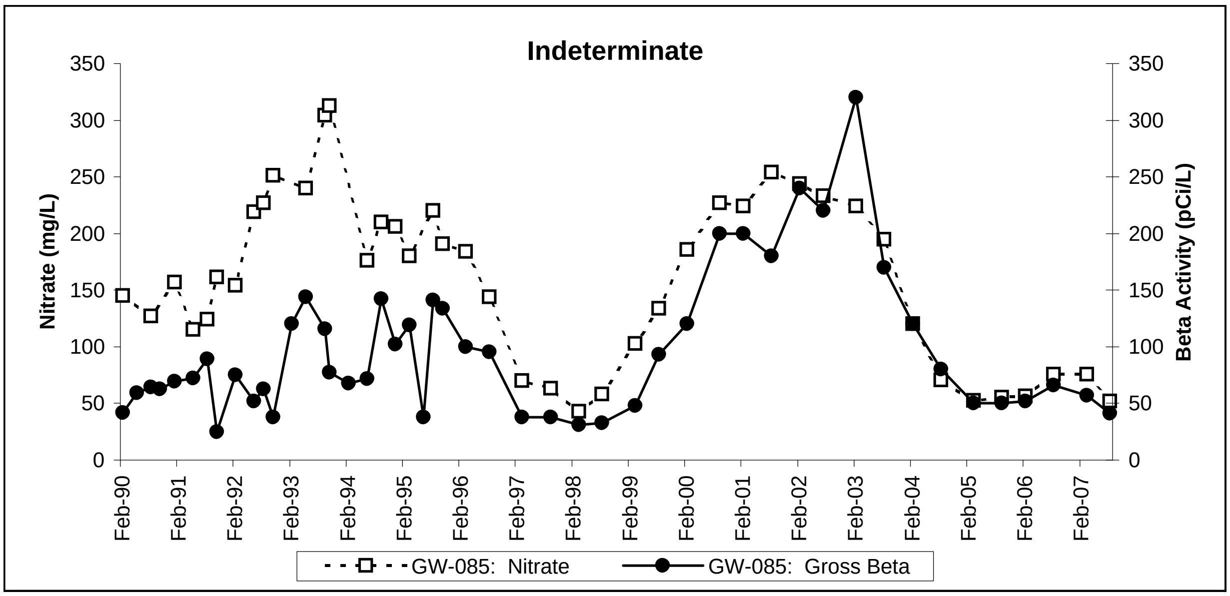
Fig. A.18. Bear Creek Regime CY 2007: nitrate and/or uranium concentration trends in surveillance monitoring aquitard wells GW-246, GW-276, and GW-615.

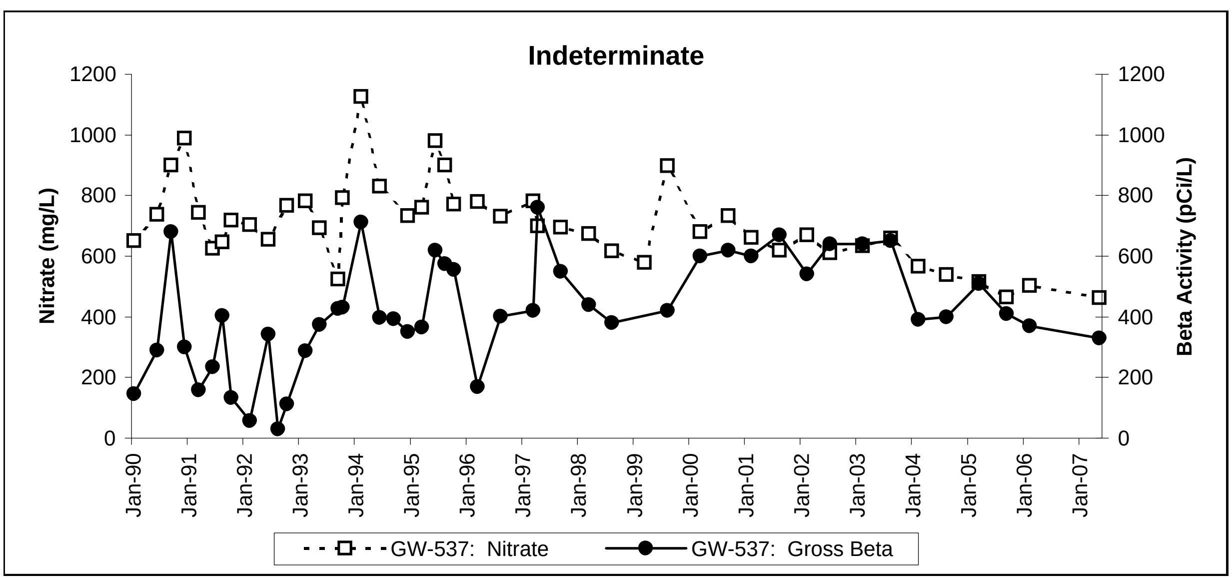


GWMR07 11/11/08

Fig. A.19. Bear Creek Regime CY 2007: selected VOC concentration trends in surveillance monitoring aquitard wells GW-014, GW-046, GW-082, GW-246, GW-276, and GW-627.

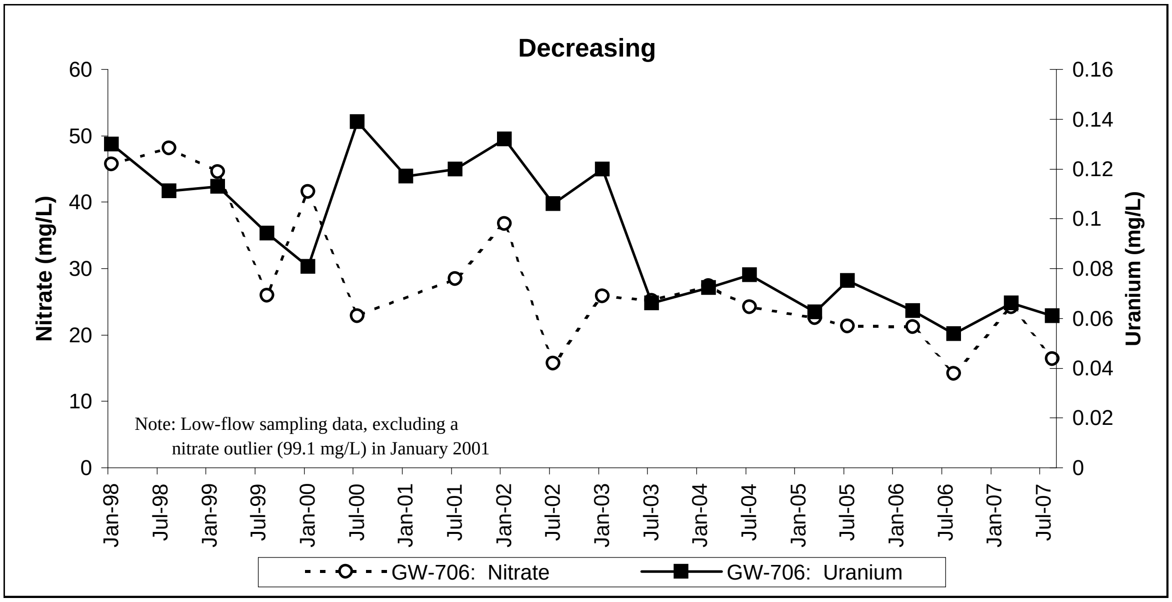


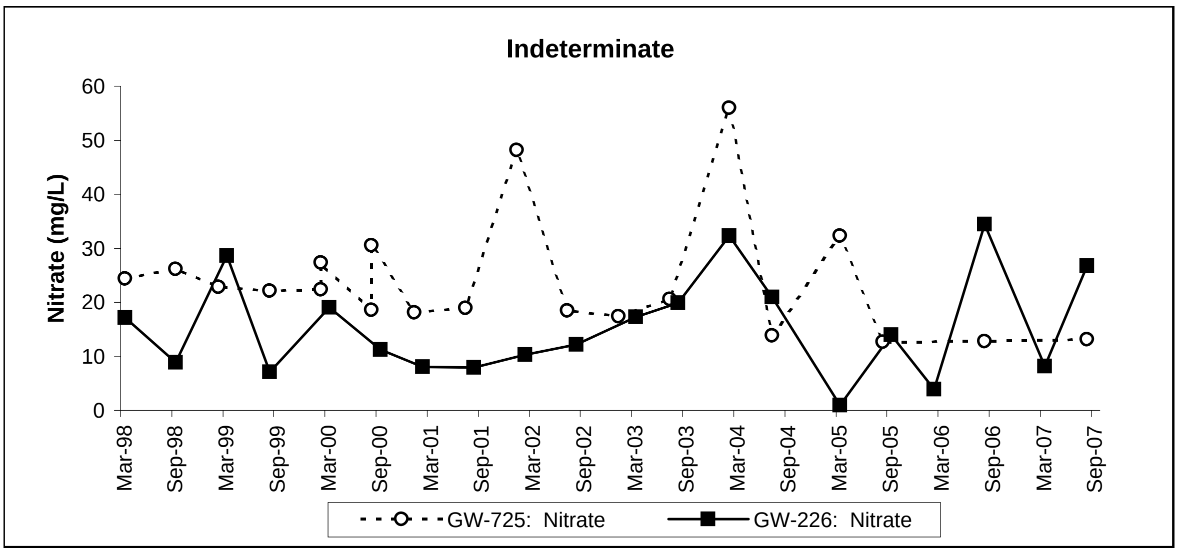


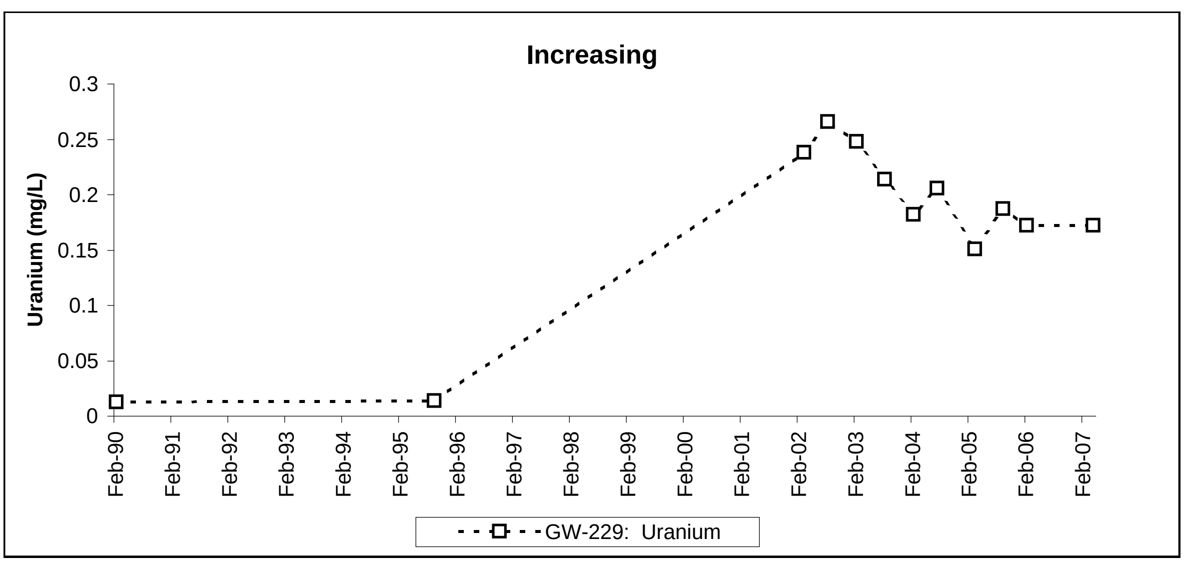


GWMR07 11/11/08

Fig. A.20. Bear Creek Regime CY 2007: gross alpha and/or gross beta activity trends in surveillance monitoring aquitard wells GW-085, GW-276, and GW-537.

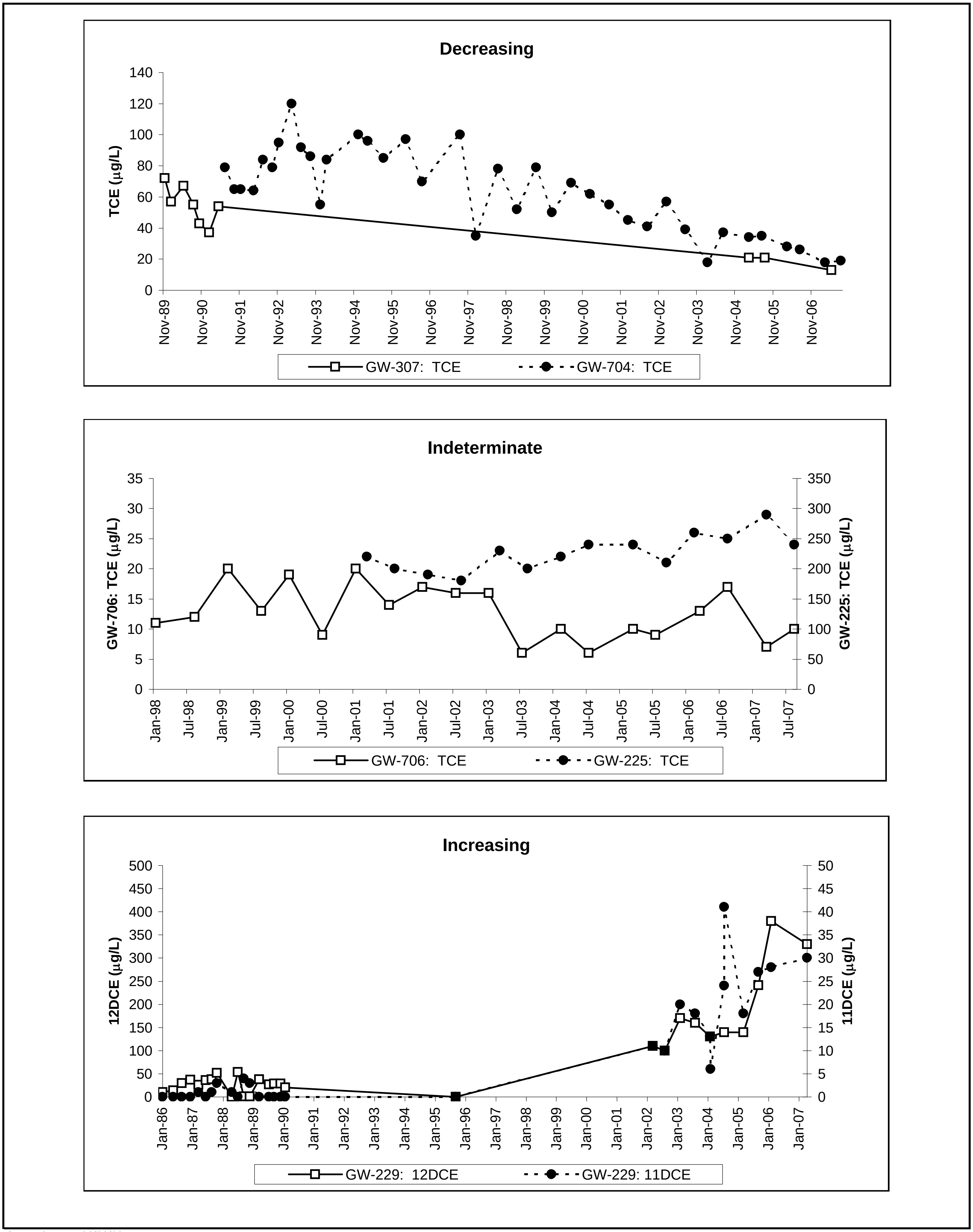






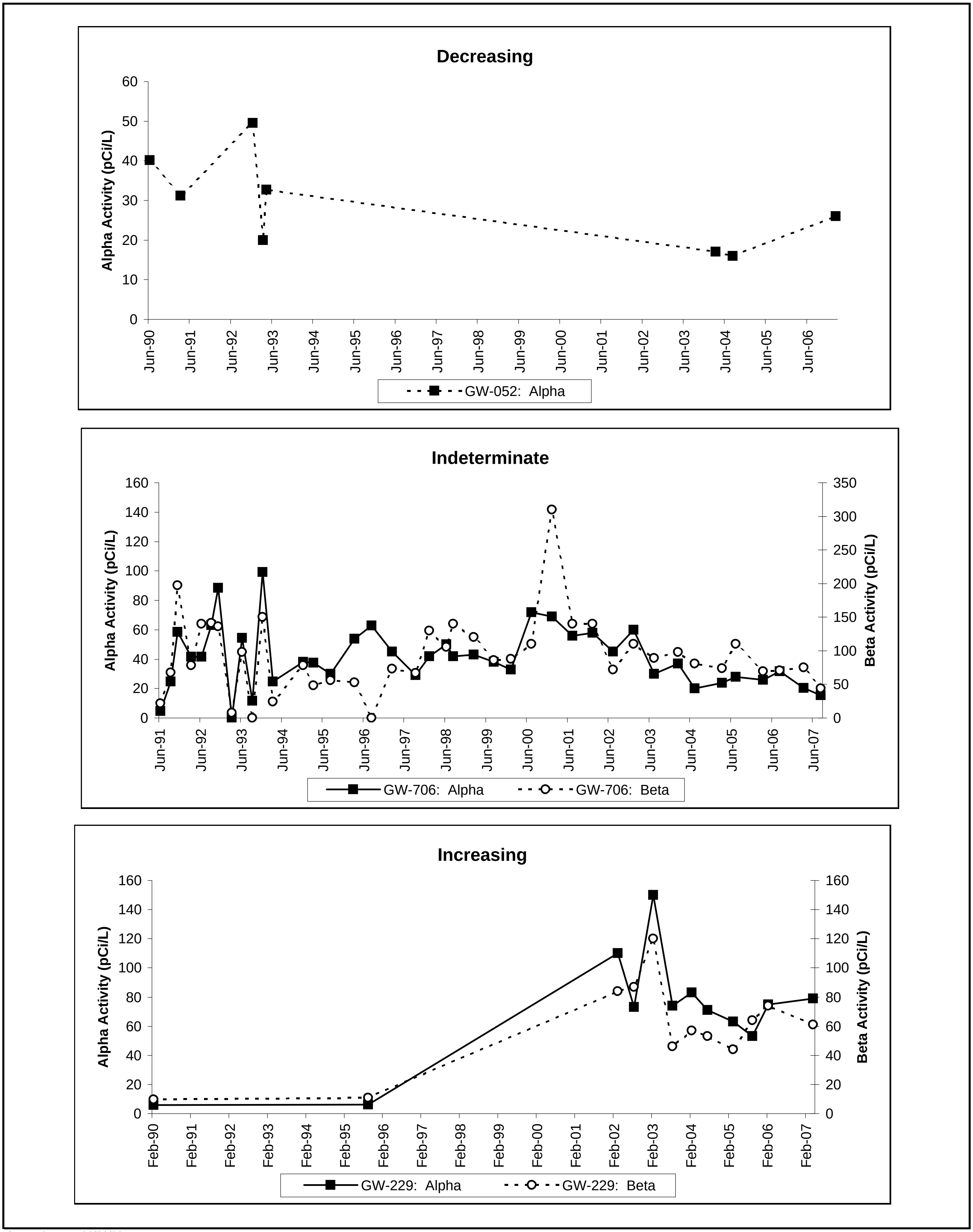
GWMR07 11/11/08

Fig. A.21. Bear Creek Regime CY 2007: nitrate and/or uranium concentration trends in surveillance monitoring aquifer wells GW-226, GW-229, GW-706, and GW-725.



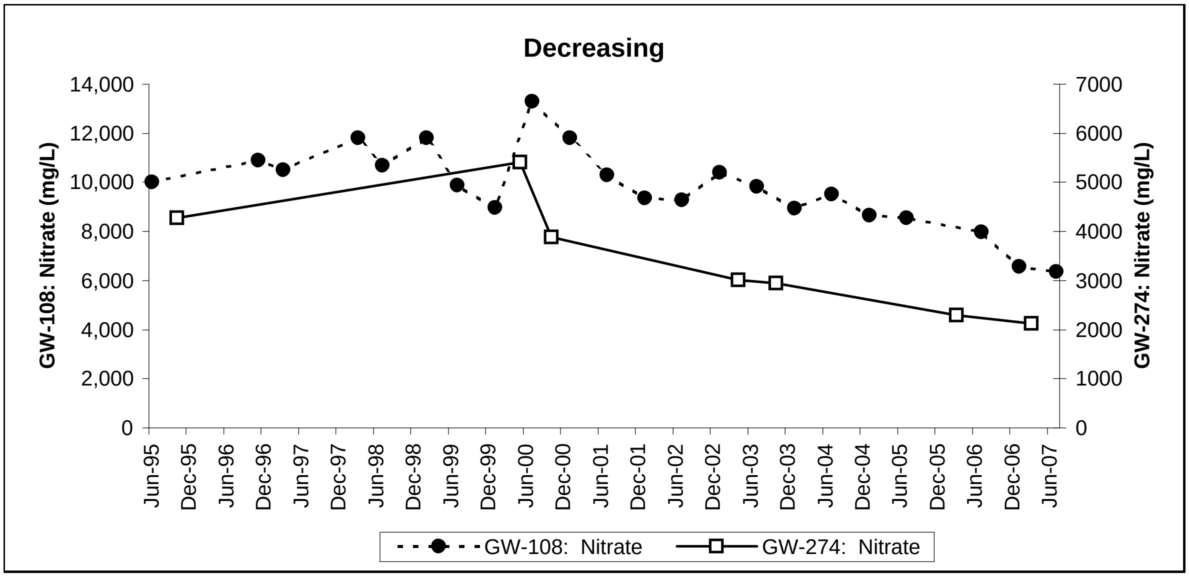
GWMR07 06/30/08

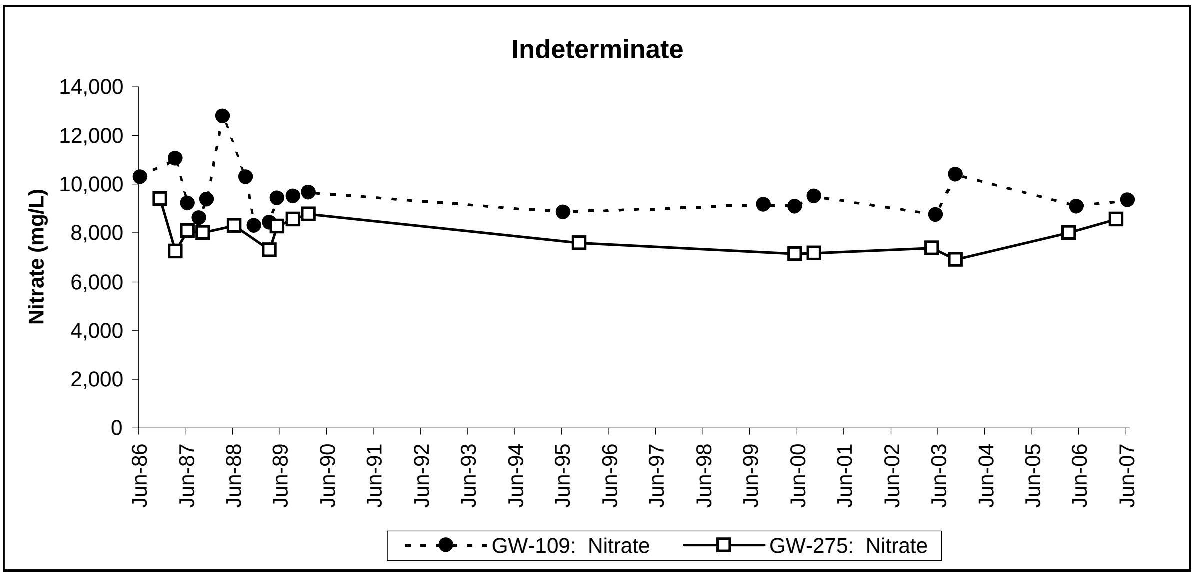
Fig. A.22. Bear Creek Regime CY 2007: selected VOC concentration trends in surveillance monitoring aquifer wells GW-225, GW-229, GW-307, GW-704, and GW-706.

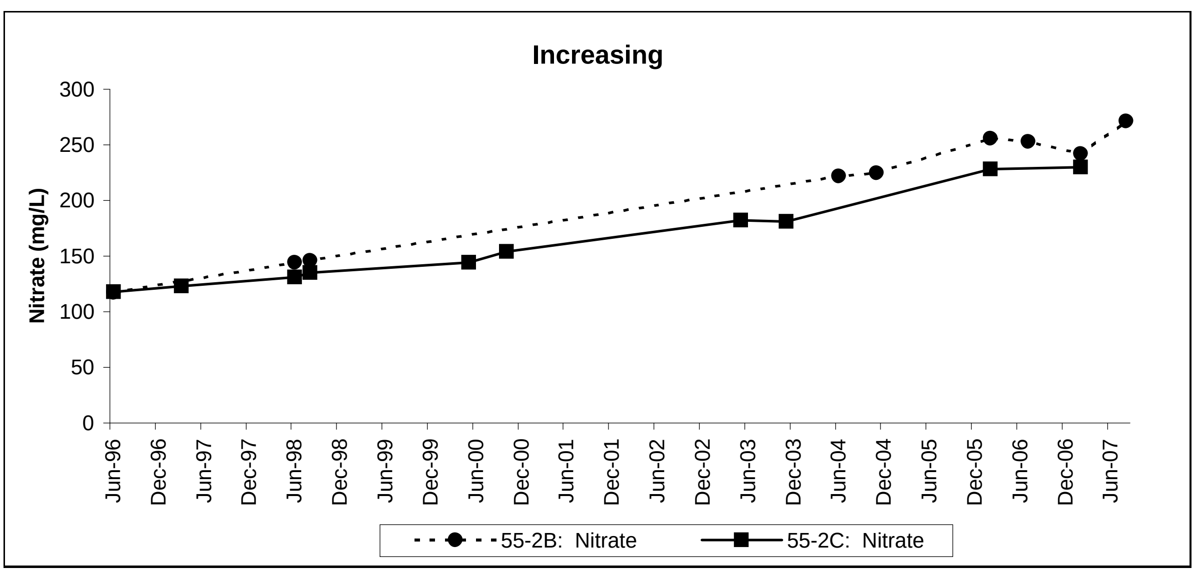


GWMR07 06/30/08

Fig. A.23. Bear Creek Regime CY 2007: gross alpha and/or gross beta activity trends in surveillance monitoring aquifer wells GW-229 and GW-706.

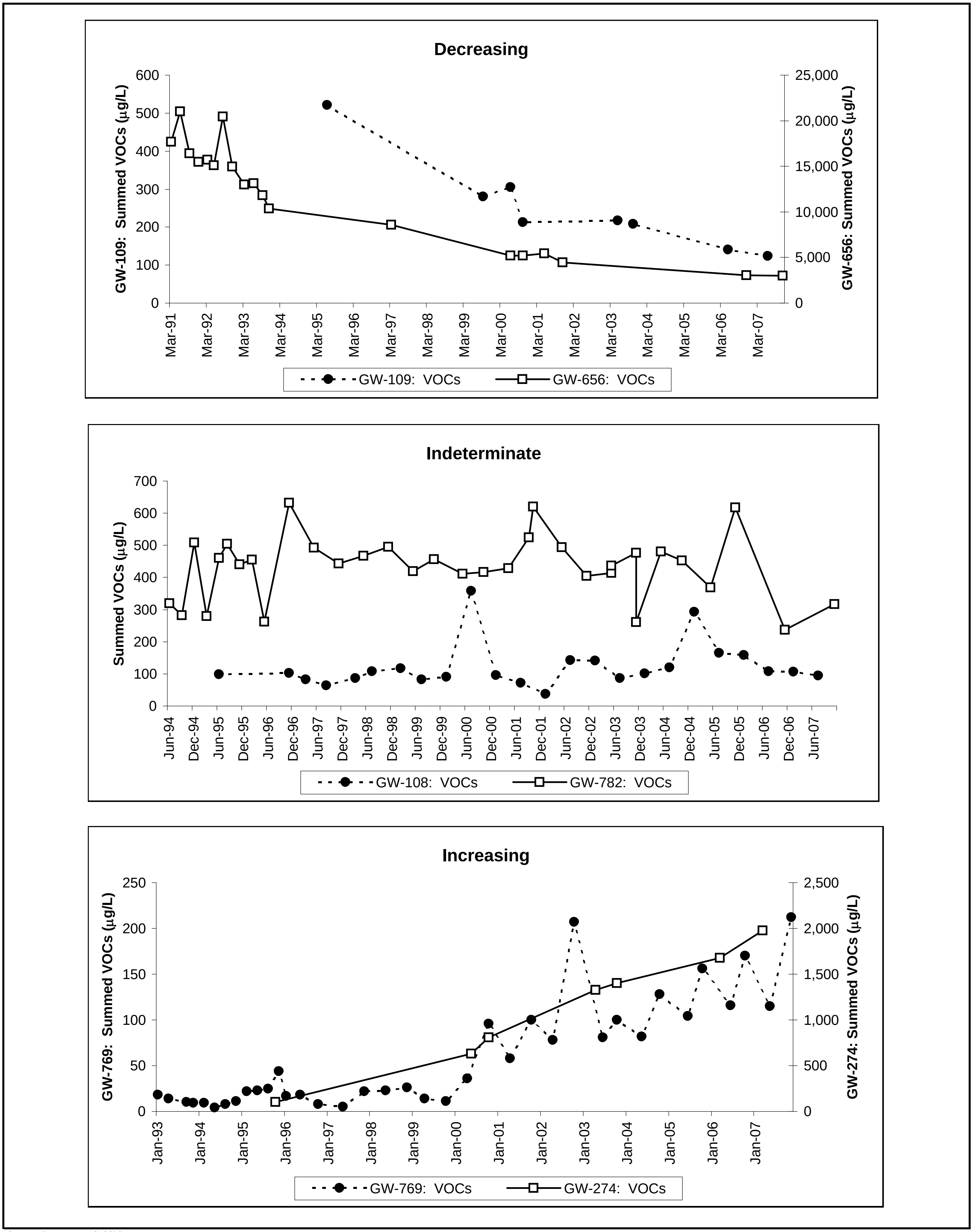






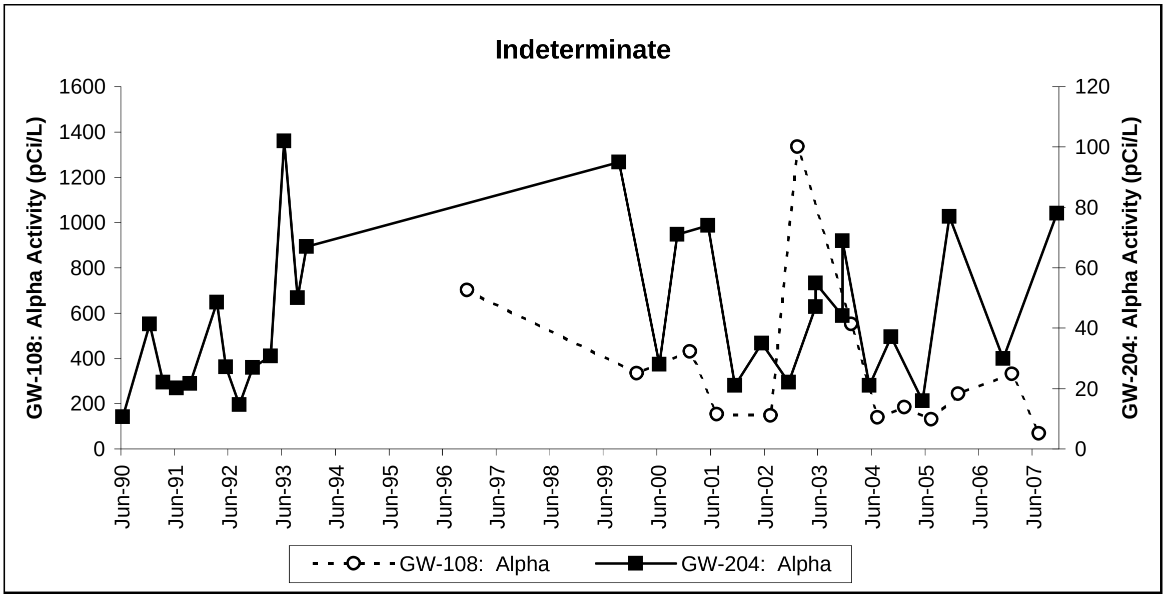
GWMR07 11/11/08

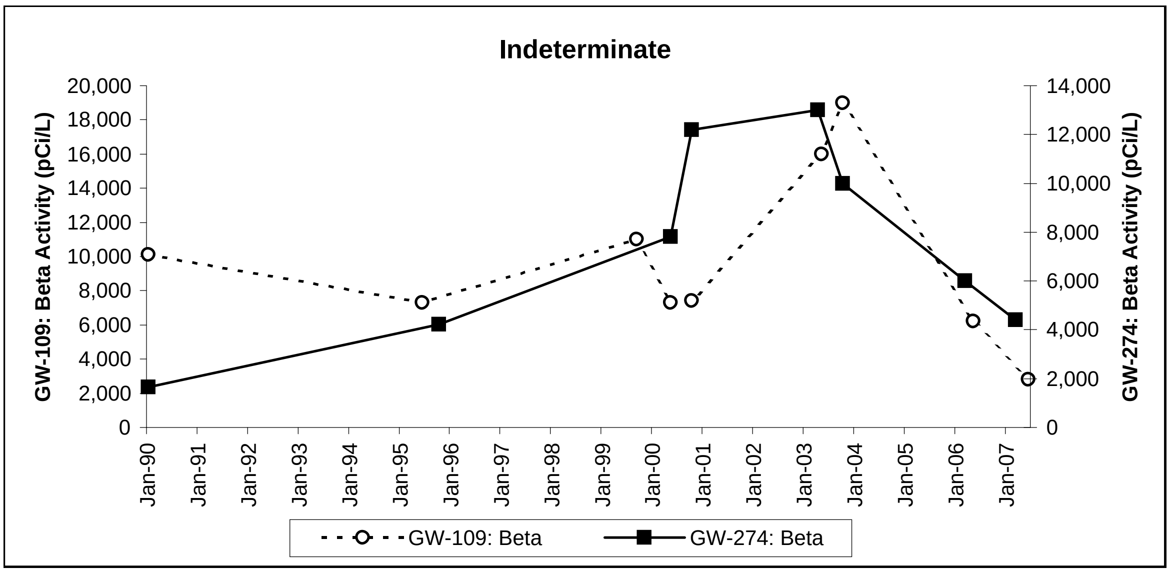
Fig. A.24. East Fork Regime CY 2007: nitrate concentration trends in surveillance monitoring aquitard wells 55-2B, 55-2C, GW-108, GW-109, GW-274, and GW-275.

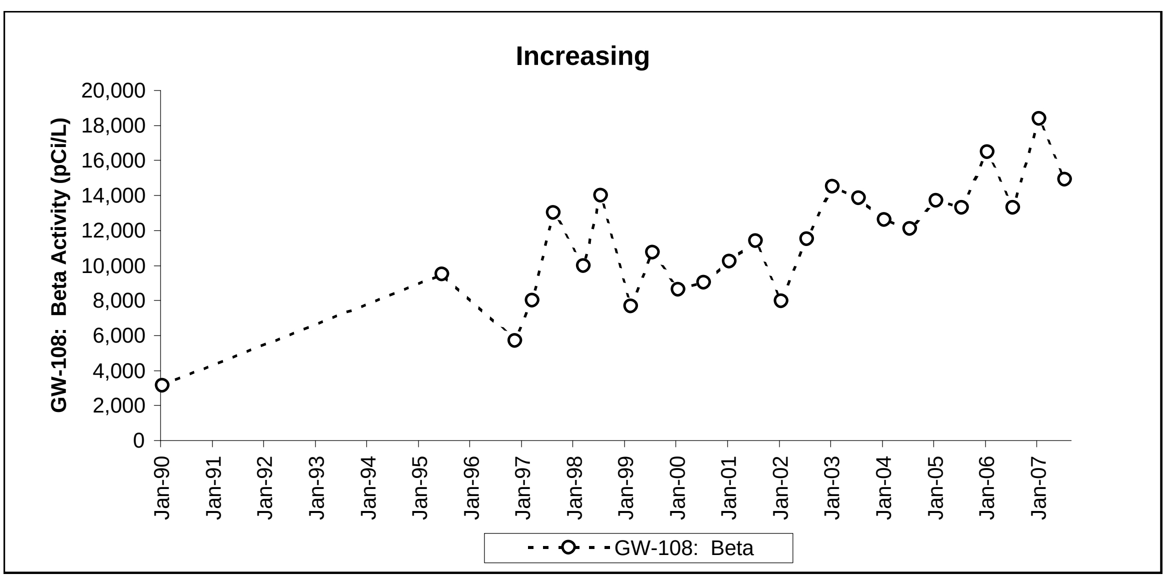


GWMR07 11/12/08

Fig. A.25. East Fork Regime CY 2007: summed VOC concentration trends in surveillance monitoring aquitard wells GW-108, GW-109, GW-274, GW-656, GW-769, and GW-782.

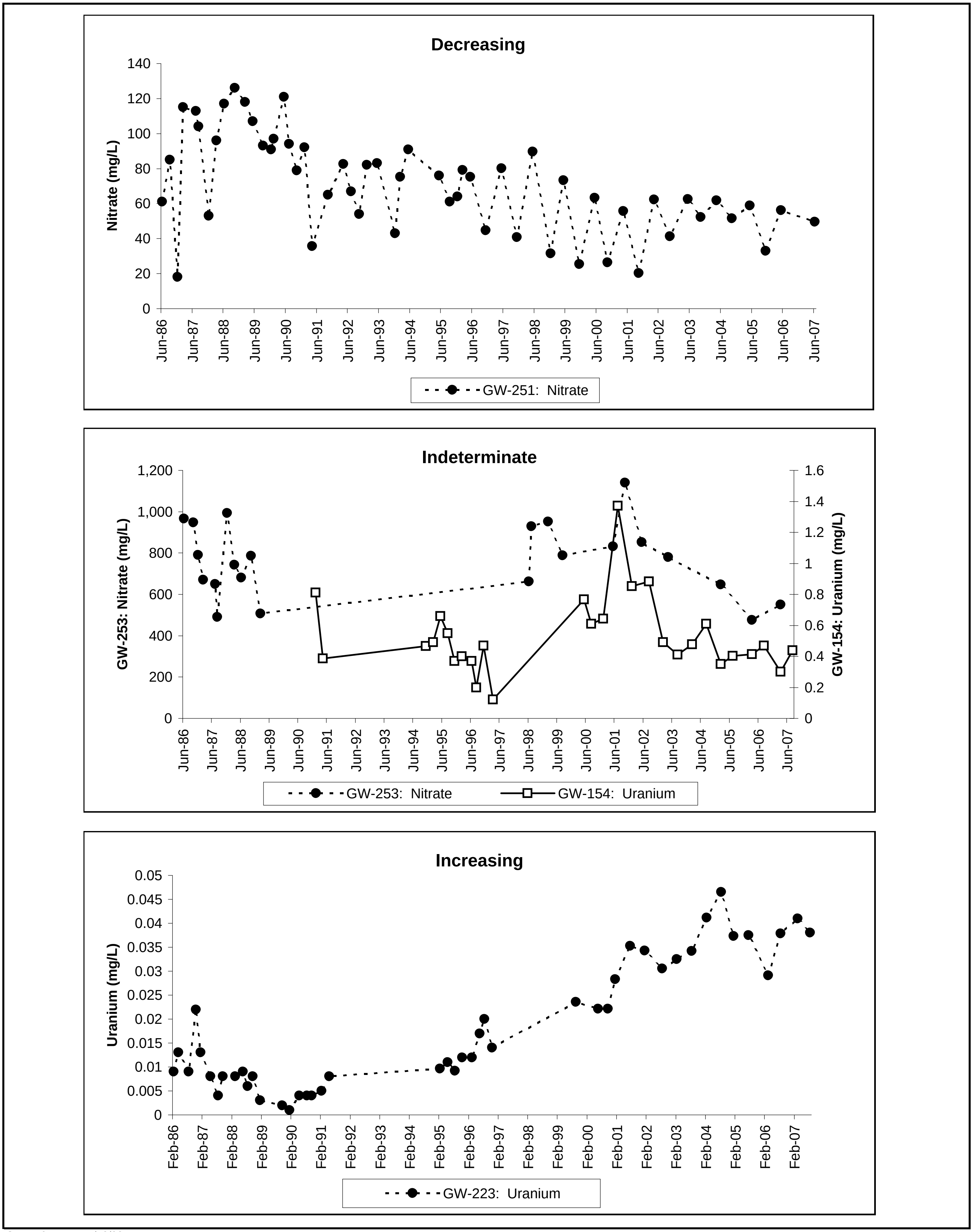






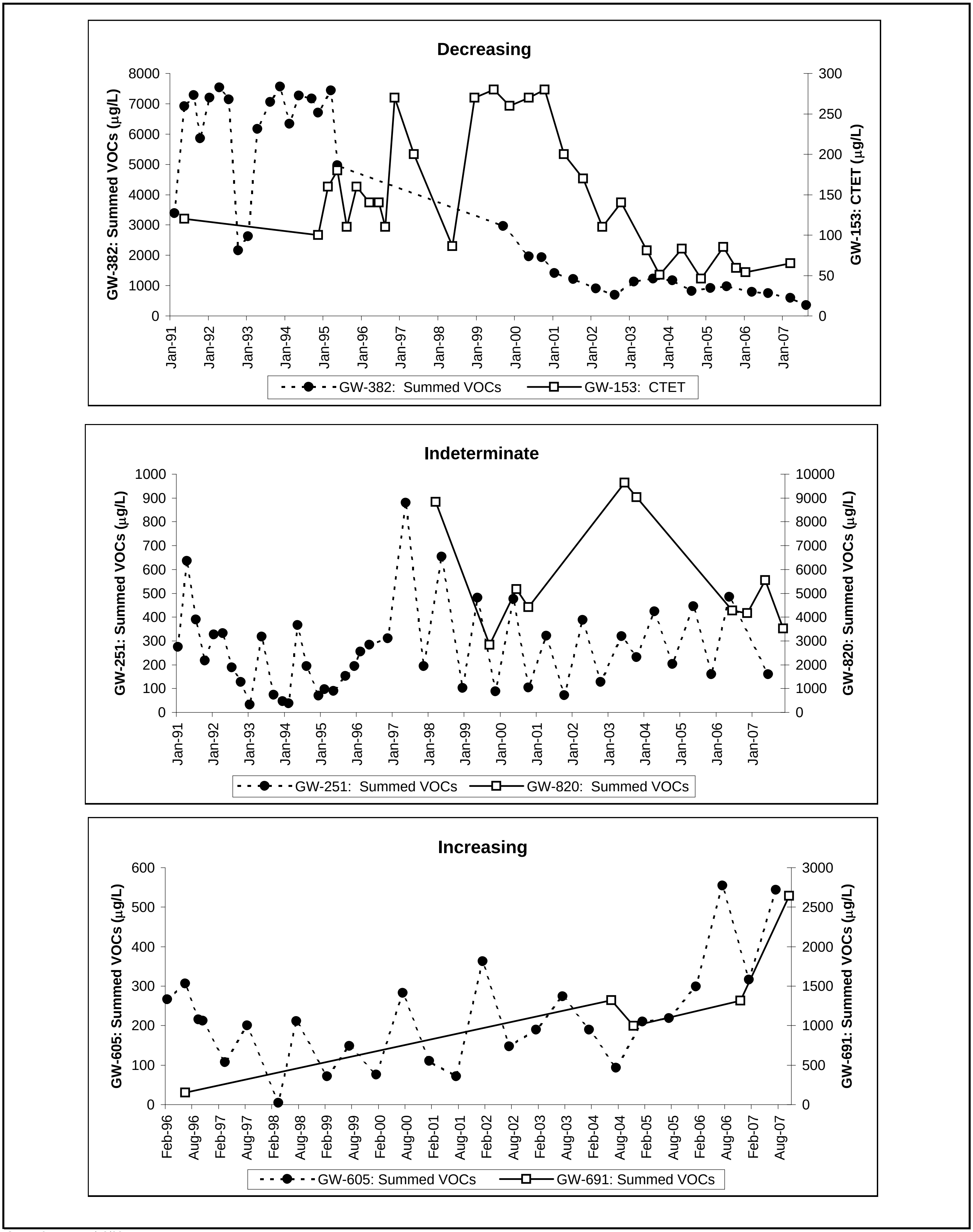
GWMR07 11/12/08

Fig. A.26. East Fork Regime CY 2007: gross alpha and/or gross beta activity trends in surveillance monitoring aquitard wells GW-108, GW-109, GW-204, and GW-274.



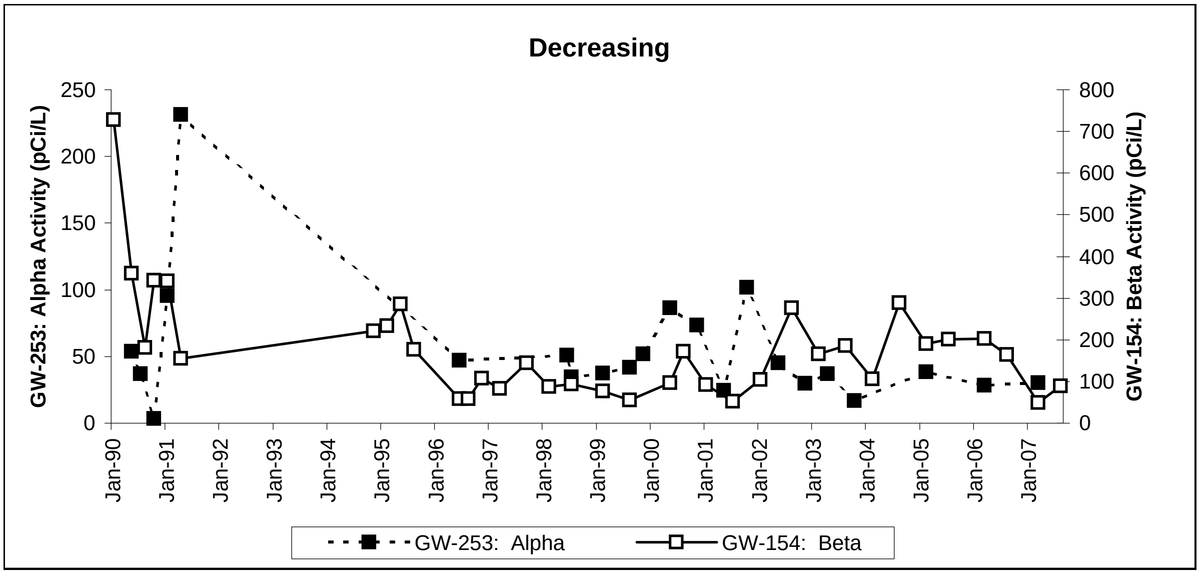
GWMR07 11/12/08

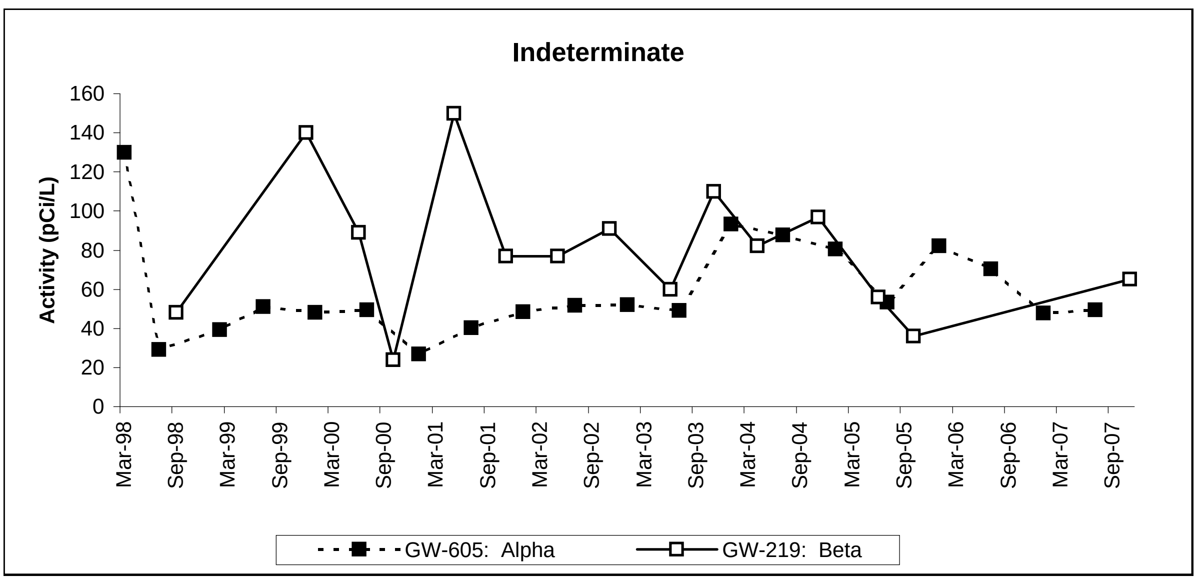
Fig. A.27. East Fork Regime CY 2007: nitrate and/or uranium concentration trends in surveillance monitoring aquifer wells GW-154, GW-223, GW-251, and GW-253.



GWMR07 11/12/08

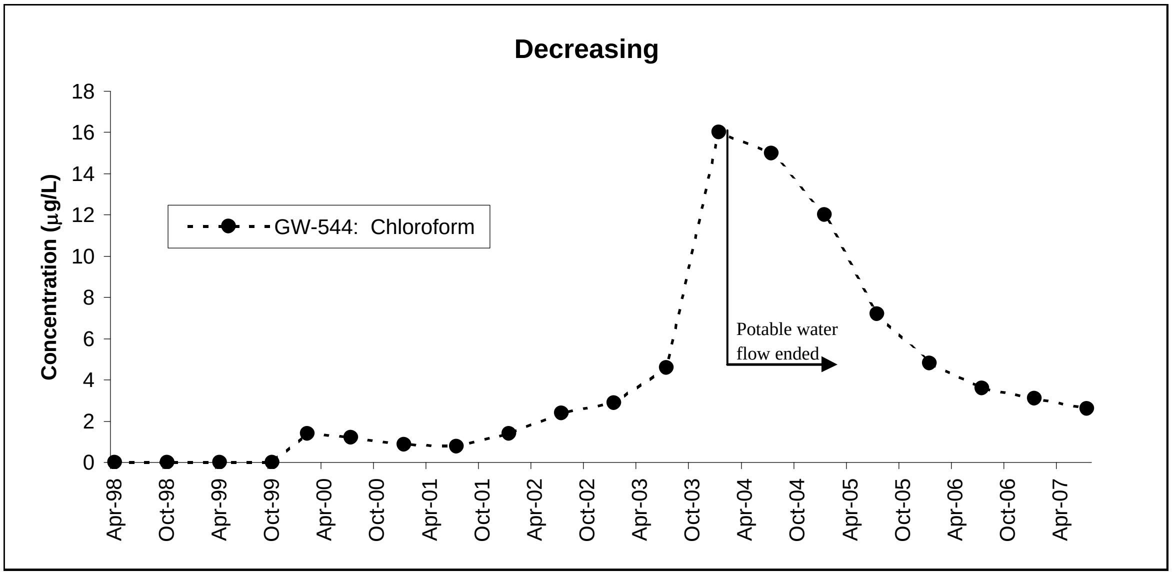
Fig. A.28. East Fork Regime CY 2007: selected VOC concentration trends in surveillance monitoring aquifer wells GW-153, GW-251, GW-382, GW-605, GW-691, and GW-820.

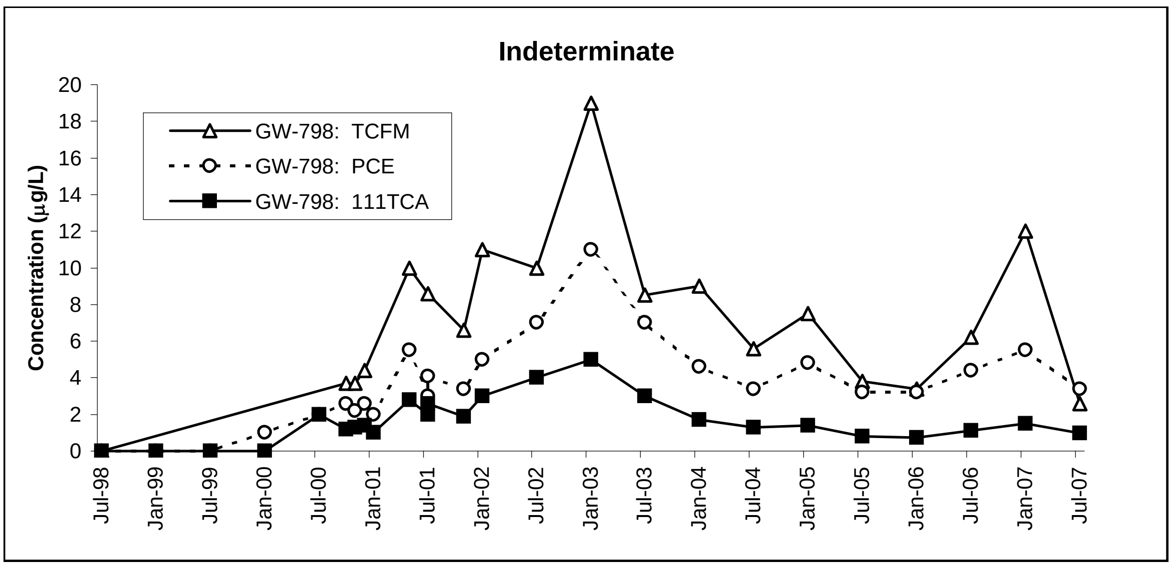


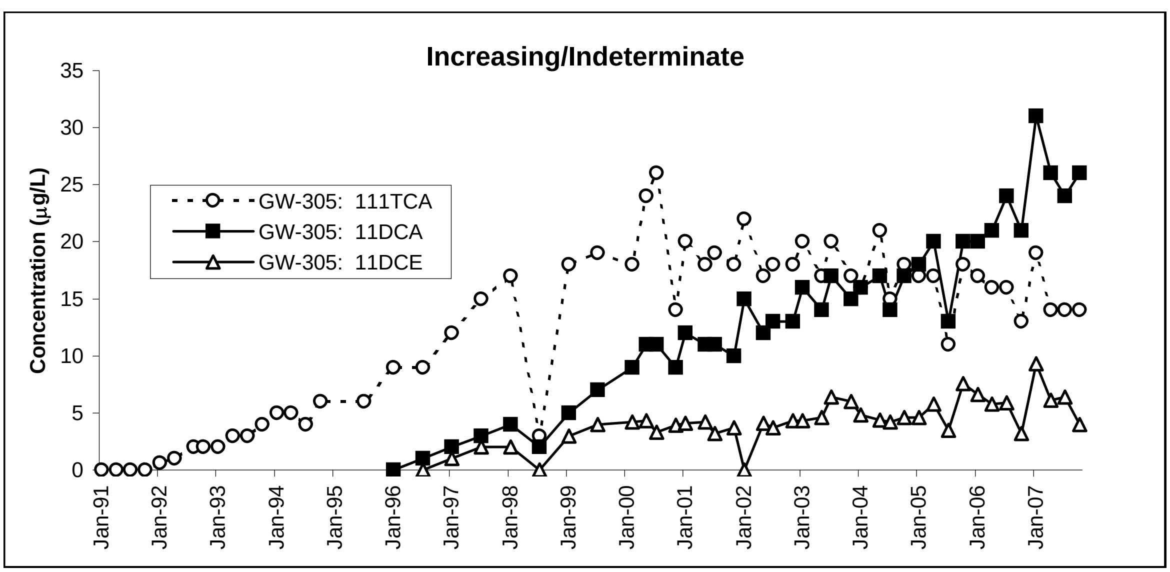


GWMR07 11/12/08

Fig. A.29. East Fork Regime CY 2007: gross alpha and/or gross beta activity trends in surveillance monitoring aquifer wells GW-154, GW-219, GW-253, and GW-605.

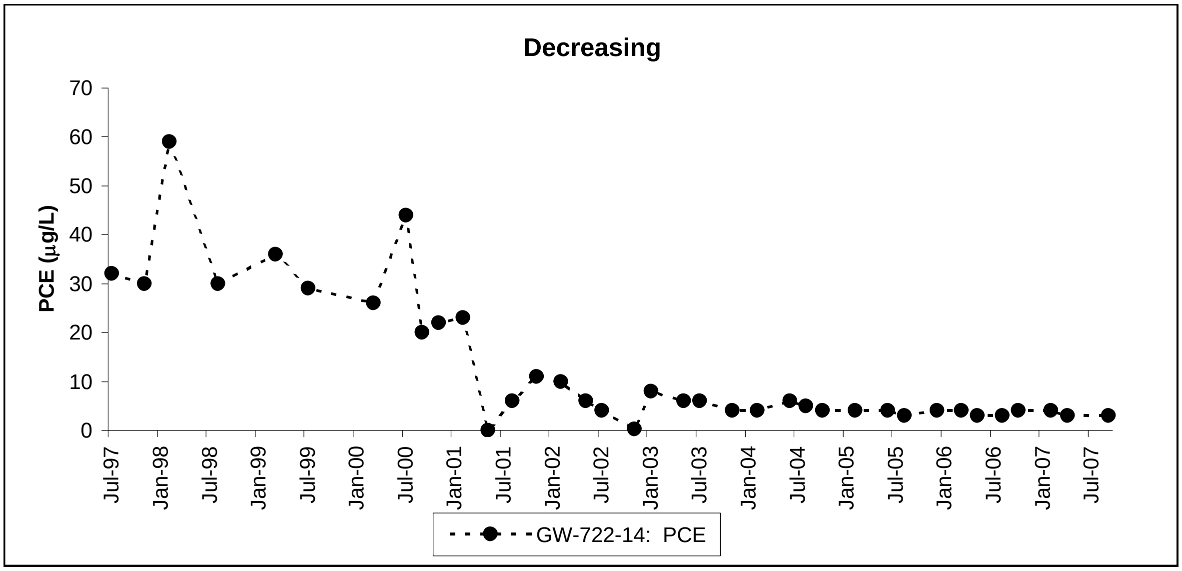


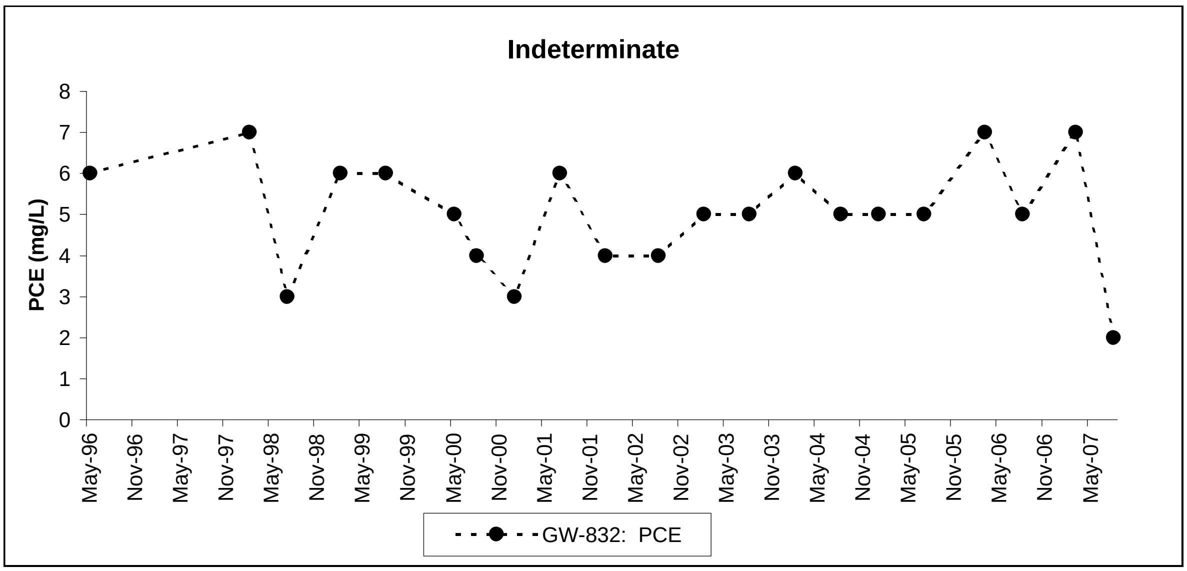


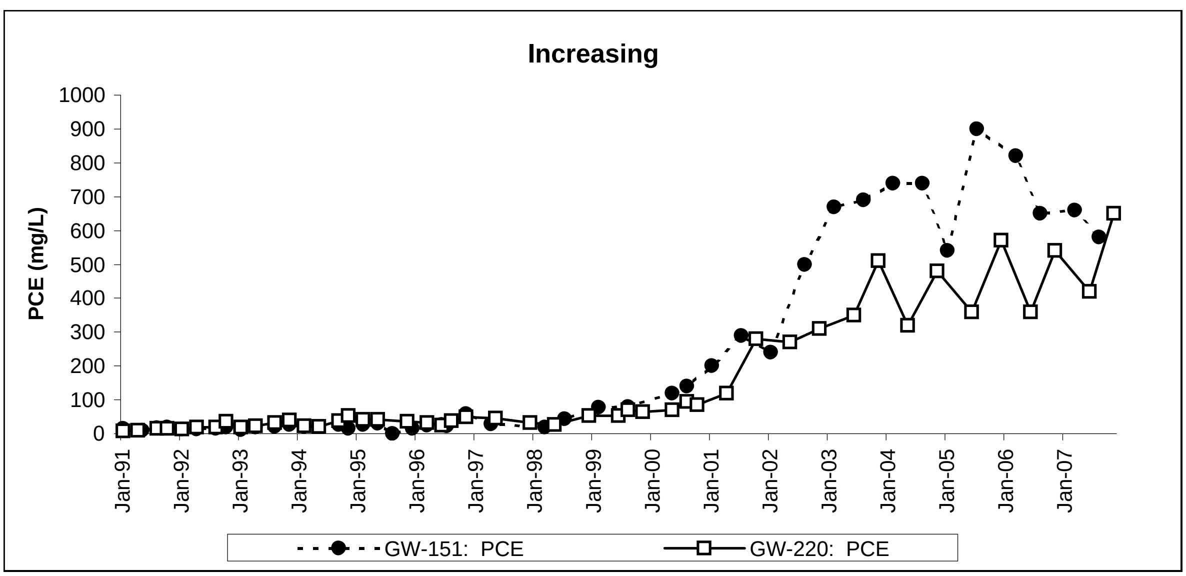


GWMR07 07/01/08

Fig. A.30. Chestnut Ridge Regime CY 2007: VOC trends in surveillance monitoring wells GW-305, GW-544, and GW-798.







GWMR07 11/13/08

Fig. A.31. East Fork Regime CY 2007: PCE concentration trends in exit pathway monitoring wells GW-151, GW-220, GW-722-14, and GW-832.

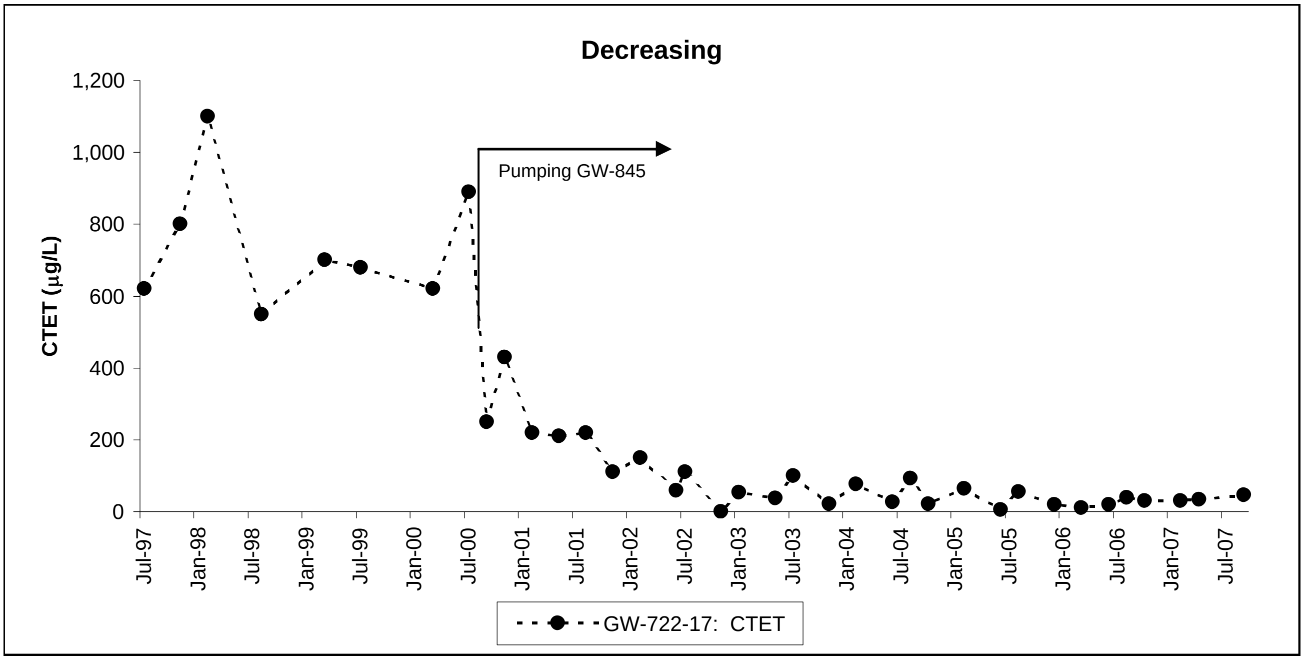


Fig. A.32. East Fork Regime CY 2007: CTET concentration trend in exit pathway monitoring well GW-722-17.

APPENDIX B

TABLES

Table B.1. Summary of CY 2007 sampling and analysis plan addenda

Addendum No.	Effective Date	Modification to the CY 2007 Sampling and Analysis Plan[1]
2007-01	01/09/07	Add well GW-629 to sample group BC-1.
2007-02	01/12/07	Replace Appendix G (purged groundwater) with the *Waste Management Plan for Waste Streams Generated from Y-12 Groundwater Protection Program Sampling Activities*.
2007-03	01/25/07	Add well GW-779 to sample group EF-1.
2007-04	01/25/07	Add well GW-960 to sample group EF-1.
2007-05	04/11/07	Add parameter group METHANOL to wells 55-2A, 55-2B, 55-3A, and 55-3B in sample group EF-1 and wells 56-2A and 56-2B in sample group EF-2 during the second quarter sampling event.
2007-06	08/21/07	Add parameter group METHANOL to nine wells in sample group EF-1 during the third quarter sampling event.
2007-07	09/06/07	Change collection of a duplicate sample from well 56-4A to well 56-6A in sample group EF-1 during the third quarter sampling event.

Note:

1 Modification to the *Y-12 Groundwater Protection Program Groundwater and Surface Water Sampling and Analysis Plan for Calendar Year 2007* (BWXT 2006a).

Table B.2. CY 2007 groundwater and surface water sampling dates in the Bear Creek Hydrogeologic Regime

BJC[1] / GWPP[2] Sampling Point[3]	Functional Area[4]	CY 2007 Sampling Date[5] 1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	DOE Order Surveillance Monitoring	DOE Order Exit Pathway/Perimeter Monitoring	RCRA Post-Closure Corrective Action Monitoring	CERCLA ROD (●), Detection (□), and Baseline (○) Monitoring
GW-008	OLF	01/02/07	.	07/02/07	.	x		●	
GW-014	BG	03/26/07	.	**08/07/07 D**	.	●			
GW-046	BG	01/03/07	.	07/02/07	.	x		●	
GW-052	BG	02/12/07	.	.	.	●			
GW-053	BG	02/13/07	.	.	.	●			
GW-071	BG	**03/21/07 D**	.	08/09/07	.	●			
GW-072	BG	03/21/07	.	.	.	●			
GW-077	BG	03/07/07	.	07/31/07	.	x			●
GW-078	BG	03/07/07	.	07/31/07	.	x			●
GW-079	BG	03/07/07	.	07/31/07	.	x			●
GW-080	BG	**03/07/07 D**	.	**07/31/07 D**	.	x			●
GW-082	BG	02/07/07	.	.	.	●			
GW-085	OLF	03/22/07	.	08/15/07	.	●			
GW-089	BG	**02/12/07 D**	.	.	.	●			
GW-098	OLF	.	04/23/07	.	.	●			
GW-100	S3	.	**05/07/07 D**	.	.	●			
GW-101	S3	.	05/09/07	.	.	●			
GW-122	S3	.	05/09/07	.	.	●			
GW-127	S3	.	05/07/07	.	.	●			
GW-225	OLF	03/20/07	.	08/13/07	.	●			
GW-226	OLF	03/20/07	.	08/13/07	.	●			
GW-229	OLF	.	04/23/07	.	.	●			
GW-236	S3	.	05/03/07	.	.	●			
GW-246	S3	03/22/07	.	08/15/07	.	●			
GW-257	BG	02/08/07	.	.	.	●			
GW-276	S3	01/03/07	.	07/09/07	.	x		●	
GW-277	S3	.	05/14/07	.	.	●			
GW-289	BG	02/08/07	.	.	.	●			
GW-307	RS	.	05/01/07	.	.	●			
GW-313	SPI	.	**05/01/07 D**	.	.	●			
GW-315	SPI	.	05/01/07	.	.	●			
GW-363	EMWMF	02/27-28/07*	04/25-26/07*	08/15/07	11/13-14/07*	x			□

Table B.2 (continued)

BJC[1]		CERCLA ROD (●), Detection (□), and Baseline (○) Monitoring							
		RCRA Post-Closure Corrective Action Monitoring							
GWPP[2]		DOE Order Exit Pathway/Perimeter Monitoring							
		DOE Order Surveillance Monitoring							
Sampling Point[3]	Functional Area[4]	CY 2007 Sampling Date[5]							
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	DOE Order Surveillance Monitoring	DOE Order Exit Pathway/Perimeter Monitoring	RCRA Post-Closure Corrective Action Monitoring	CERCLA ROD (●), Detection (□), and Baseline (○) Monitoring
GW-368	OLF	.	04/26/07	.	.	●			
GW-369	OLF	.	04/30/07	.	.	●			
GW-537	OLF	.	05/03/07	.	.	●			
GW-601	OLF	.	04/24/07	.	.	●			
GW-615	S3	.	05/14/07	.	.	●			
GW-616	S3	.	05/10/07	.	.	●			
GW-626	BG	03/19/07	.	08/02/07	.	●			
GW-627	BG	03/19/07	.	08/06/07	.	●			
GW-629	BG	01/09/07	.	08/06/07	.	●			
GW-639	EMWMF	02/14/07	04/17-19/07*	08/14/07	11/14-15/07*	x			□
GW-653	BG	02/07/07	.	.	.	●			
GW-683	EXP-A	03/07/07	.	08/01/07	.	x			●
GW-684	EXP-A	03/07/07	.	07/26/07	.	x			●
GW-694	EXP-B	.	.	**08/16/07 D**	.	●			
GW-703	EXP-B	.	.	08/16/07	.	●			
GW-704	EXP-B	03/08/07	.	08/01/07	.	x			●
GW-706	EXP-B	03/08/07	.	08/01/07	.	x			●
GW-712	EXP-W	01/02/07	.	07/02/07	.		x	●	
GW-713	EXP-W	**01/02/07 D**	.	**07/03/07 D**	.		x	●	
GW-714	EXP-W	01/02/07	.	07/02/07	.		x	●	
GW-724	EXP-C	.	.	08/20/07	.	●			
GW-725	EXP-C	.	.	08/20/07	.	●			
GW-738	EXP-C	.	.	08/21/07	.	●			
GW-740	EXP-C	.	.	08/21/07	.	●			
GW-916	EMWMF	02/27/07	04/24/07	08/13-14/07*	11/07/07	x			□
GW-917	EMWMF	02/22/07	04/18/07	08/09/07	11/05/07	x			□
GW-918	EMWMF	02/27/07	04/16/07	08/14/07	11/06/07	x			□
GW-920	EMWMF	02/20/07	04/17/07	08/08/07	11/14/07	x			□
GW-921	EMWMF	02/26-27/07*	04/23/07	08/07/07	11/06/07	x			□
GW-922	EMWMF	02/20/07	04/17/07	08/08/07	11/06/07	x			□
GW-923	EMWMF	02/26-28/07*	04/23-24/07*	Dry	Dry	x			□
GW-924	EMWMF	**02/26/07 D**	**04/25/07 D**	**08/13/07 D**	**11/07/07 D**	x			□
GW-925	EMWMF	02/15-16/07*	04/23-25/07*	08/07-08/07*	11/06-07/07*	x			□
GW-926	EMWMF	02/26/07	04/24/07	08/13/07	11/12/07	x			□
GW-927	EMWMF	02/21/07	04/18/07	08/13/07	11/05/07	x			□

Table B.2 (continued)

BJC[1]									CERCLA ROD (●), Detection (□), and Baseline (○) Monitoring
								RCRA Post-Closure Corrective Action Monitoring	
GWPP[2]							DOE Order Exit Pathway/Perimeter Monitoring		
						DOE Order Surveillance Monitoring			
Sampling Point[3]	Functional Area[4]	CY 2007 Sampling Date[5]							
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter				
BCK-04.55	EXP-SW	.	.	**08/01/07 D**	.		●		
EMWNT-03A	EXP-SW	02/20/07	04/16/07	Dry	11/06/07		**x**		□
EMWNT-05	EXP-SW	02/20/07	04/16/07	Dry	11/06/07		**x**		□
EMW-VWEIR	EXP-SW	02/20/07	04/16/07	Dry	11/06/07		**x**		□
EMW-VWUND	EXP-SW	02/22/07	**04/26/07 D**	08/09/07	11/08/07		**x**		□
NT-01	EXP-SW	.	.	08/01/07	.		●		
NT-04	EXP-SW	02/20/07	04/16/07	Dry	11/06/07		**x**		□
NT-07	EXP-SW	01/04/07	.	Dry	.		**x**		○
NT-08	EXP-SW	01/04/07	.	08/09/07	.		**x**		○
SS-1	EXP-SW	.	.	Dry	.		●		
SS-4	EXP-SW	.	.	08/01/07	.		●		
SS-5	EXP-SW	.	.	08/01/07	.		●		
SS-6	EXP-SW	01/03/07	.	07/02/07	.		**x**	●	

Notes:

1 Groundwater and surface water sampling performed for monitoring programs managed by Bechtel Jacobs Company LLC (BJC).

2 Groundwater and surface water sampling performed for the Y-12 Groundwater Protection Program (GWPP), managed by BWXT Y-12, L.L.C.

x - Denotes the DOE Order monitoring category (surveillance or exit pathway/perimeter) fulfilled by samples collected under programs managed by BJC. Although the CY 2007 samples were collected for various monitoring purposes, all of the data meet DOE Order monitoring requirements. Surveillance and exit pathway/perimeter monitoring data evaluations are provided in Section 4.

3 BCK - Bear Creek Kilometer

EMW-VWUND - EMW-VWUNDRDRAIN; outfall for an underdrain installed to lower the water table and relieve hydrostatic pressure beneath the EMWMF liners.

GW - Groundwater Monitoring Well

NT - Northern Tributary (to Bear Creek)

SS - Spring sampling location (south side of Bear Creek)

Table B.2 (continued)

Notes: (continued)

4	BG	-	Bear Creek Burial Grounds Waste Management Area
	EMWMF	-	Environmental Management Waste Management Facility
	EXP-A	-	Exit Pathway (Maynardville Limestone) Picket A
	EXP-B	-	Exit Pathway Picket B
	EXP-C	-	Exit Pathway Picket C
	EXP-SW	-	Exit Pathway (Bear Creek) Surface Water
	EXP-W	-	Exit Pathway Picket W
	OLF	-	Oil Landfarm Waste Management Area
	RS	-	Rust Spoil Area
	S3	-	S-3 Site
	SPI	-	Spoil Area I
5	**.**	-	Not sampled
	Dry	-	Insufficient water volume for sample collection
	D	-	Duplicate sample collected on specified date
	*	-	Field measurements obtained on the initial date shown, with laboratory samples collected on subsequent days; dependant upon groundwater volume in well after purging.

Table B.3. CY 2007 groundwater and surface water sampling dates in the Upper East Fork Poplar Creek Hydrogeologic Regime

BJC [1] / GWPP [2] Sampling Point [3]	Functional Area [4]	CY 2007 Sampling Date [5] 1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	DOE Order Surveillance Monitoring	DOE Order Exit Pathway/Perimeter Monitoring	RCRA Post-Closure Corrective Action Monitoring	CERCLA ROD (●) and Baseline (○) Monitoring
55-1A	GRID B2	.	06/11/07	.	.	●			
55-2A	GRID B3	02/20/07	04/12/07	08/23/07	.	●			
55-2B	GRID B3	02/20/07	04/11/07	08/23/07	.	●			
55-2C	GRID B3	02/20/07	.	.	.	●			
55-3A	B9201-5	02/21/07	04/11/07	08/22/07	.	●			
55-3B	B9201-5	02/21/07	04/12/07	08/22/07	.	●			
55-3C	B9201-5	02/21/07	.	08/27/07	.	●			
56-1A	Y12	.	06/07/07	.	10/15/07	●			
56-2A	GRID C3	**03/01/07 D**	04/11/07	.	.	●			
56-2B	GRID C3	03/05/07	04/12/07	.	.	●			
56-2C	GRID C3	03/05/07	.	.	.	●			
56-3A	Y12	**02/22/07 D**	.	08/30/07	.	●			
56-3B	Y12	02/22/07	.	09/04/07	.	●			
56-3C	Y12	02/22/07	.	09/05/07	.	●			
56-4A	Y12	02/26/07	.	09/05/07	.	●			
56-6A	Y12	02/26/07	.	**09/06/07 D**	.	●			
56-8A	Y12	.	Dry	.	Dry	●			
60-1A	Y12	.	05/30/07	.	11/19/07	●			
GW-105	S3	.	06/14/07	.	.	●			
GW-106	S3	.	06/18/07	.	.	●			
GW-108	S3	01/04/07	.	07/10/07	.	x		●	
GW-109	S3	.	06/20/07	.	.	●			
GW-151	NHP	03/01/07	.	08/01/07	.		x		●
GW-153	NHP	03/08/07	.	.	.	●			
GW-154	NHP	03/05/07	.	08/15/07	.	x			●
GW-169	EXP-UV	03/01/07	.	08/02/07	.	x			●
GW-170	EXP-UV	**03/01/07 D**	.	**08/02/07 D**	.	x			●
GW-171	EXP-UV	03/07/07	.	.	.	x			●
GW-172	EXP-UV	03/07/07	.	.	.	x			●
GW-192	B4	.	06/11/07	.	.	●			
GW-193	T2331	01/04/07	.	07/09/07	.	x		●	
GW-204	T0134	.	.	.	11/13/07	●			
GW-219	UOV	.	.	.	11/28/07	●			
GW-220	NHP	.	06/04/07	.	11/20/07		●		
GW-223	NHP	03/06/07	.	08/06/07	.	x			●
GW-230	EXP-UV	03/07/07	.	.	.	x			●

Table B.3 (continued)

BJC [1] / GWPP [2]		CY 2007 Sampling Date [5]							
Sampling Point [3]	**Functional Area [4]**	**1st Quarter**	**2nd Quarter**	**3rd Quarter**	**4th Quarter**	**DOE Order Surveillance Monitoring**	**DOE Order Exit Pathway/Perimeter Monitoring**	**RCRA Post-Closure Corrective Action Monitoring**	**CERCLA ROD (●) and Baseline (○) Monitoring**
GW-240	NHP	03/08/07	.	.	.	●			
GW-251	S2	.	06/25/07	.	.	●			
GW-253	S2	03/08/07	.	.	.	x			○
GW-265	SY	.	**06/05/07 D**	.	10/17/07	●			
GW-269	SY	.	06/05/07	.	10/17/07	●			
GW-270	SY	.	**06/06/07 D**	.	.	●			
GW-272	SY	03/14/07	.	.	.	●			
GW-273	SY	.	06/06/07	.	.	●			
GW-274	SY	03/13/07	.	.	.	●			
GW-275	SY	03/13/07	.	.	.	●			
GW-281	FF	.	05/01/07	.	.	x			○
GW-332	WCPA	03/06/07	.	.	.	●			
GW-336	WCPA	03/06/07	.	.	.	●			
GW-337	WCPA	03/06/07	.	.	.	●			
GW-380	NHP	03/05/07	.	08/15/07	.	x			●
GW-381	NHP	.	.	.	12/04/07	●			
GW-382	NHP	03/06/07	.	08/02/07	.	x			●
GW-383	NHP	.	06/20/07	.	**11/19/07 D**	●			
GW-505	RG	.	06/18/07	.	.	●			
GW-605	EXP-I	**01/03/07 D**	.	**07/09/07 D**	.	x		●	
GW-606	EXP-I	01/03/07	.	07/09/07	.	x		●	
GW-618	EXP-E	03/08/07	.	.	.	x			○
GW-620	FTF	.	06/19/07	.	.	●			
GW-656	T0134	.	.	.	11/13/07	●			
GW-658	FF	.	05/01/07	.	.	x			○
GW-686	CPT	.	06/13/07	.	**10/18/07 D**	●			
GW-690	CPT	.	.	.	10/22/07	●			
GW-691	CPT	.	.	.	10/22/07	●			
GW-692	CPT	.	.	.	10/16/07	●			
GW-698	B8110	.	06/13/07	.	10/16/07	●			
GW-700	B8110	.	.	.	**10/25/07 D**	●			
GW-722-06	EXP-J	.	.	09/13/07	.		●		
GW-722-10	EXP-J	.	.	09/17/07	.		●		
GW-722-14	EXP-J	02/28/07	04/05/07	.	.		x		●
GW-722-14	EXP-J	.	.	09/18/07	.		●		
GW-722-17	EXP-J	02/28/07	04/05/07		.		x		●

Table B.3 (continued)

BJC[1] / GWPP[2] Sampling Point[3]	Functional Area[4]	CY 2007 Sampling Date[5] 1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	DOE Order Surveillance Monitoring	DOE Order Exit Pathway/Perimeter Monitoring	RCRA Post-Closure Corrective Action Monitoring	CERCLA ROD (●) and Baseline (○) Monitoring
GW-722-17	EXP-J	.	.	09/18/07	.		●		
GW-722-20	EXP-J	02/28/07	04/04/07	.	.		x		●
GW-722-20	EXP-J	.	.	09/17/07	.		●		
GW-722-22	EXP-J	02/28/07	04/04/07	.	.		x		●
GW-722-22	EXP-J	.	.	09/17/07	.		●		
GW-722-26	EXP-J	.	.	09/13/07	.		●		
GW-722-30	EXP-J	.	.	09/13/07	.		●		
GW-722-32	EXP-J	.	.	**09/13/07 D**	.		●		
GW-722-33	EXP-J	02/28/07	04/03/07	.	.		x		●
GW-722-33	EXP-J	.	.	09/17/07	.		●		
GW-733	EXP-J	01/04/07	.	07/09/07	.		x	●	
GW-735	EXP-J	**03/08/07 D**	.	.	.		●		
GW-744	GRID K1	03/15/07	.	.	.		●		
GW-747	GRID K2	03/15/07	.	.	.		●		
GW-750	EXP-J	03/07/07	.	.	.		●		
GW-762	GRID J3	**03/01/07 D**	.	**08/06/07 D**	.	x			●
GW-763	GRID J3	.	.	.	12/03/07	●			
GW-765	GRID E1	.	.	.	12/03/07	●			
GW-769	GRID G3	.	05/29/07	.	11/13/07	●			
GW-770	GRID G3	.	05/29/07	.	11/12/07	●			
GW-775	GRID H3	.	.	.	**11/29/07 D**	●			
GW-776	GRID H3	.	.	.	11/29/07	●			
GW-779	GRID F2	02/27/07	.	09/10/07	.	●			
GW-781	GRID E3	.	.	.	11/27/07	●			
GW-782	GRID E3	.	.	.	11/27/07	●			
GW-783	GRID E3	.	.	.	11/28/07	●			
GW-791	GRID D2	.	.	.	11/12/07	●			
GW-792	GRID D2	.	.	.	11/12/07	●			
GW-802	FF	.	05/01/07	.	.	x			○
GW-816	EXP-SR	03/07/07	.	.	.		●		
GW-820	B9201-2	.	05/30/07	.	11/20/07	●			
GW-832	NHP	03/05/07	.	08/15/07	.		x		●
GW-954-1	Y12	.	05/23/07	.	10/30/07	●			
GW-954-2	Y12	.	05/23/07	.	10/30/07	●			
GW-954-3	Y12	.	05/23/07	.	10/30/07	●			
GW-956-1	Y12	.	**05/22/07 D**	.	10/29/07	●			

Table B.3 (continued)

BJC [1]									CERCLA ROD (●) and Baseline (○) Monitoring
								RCRA Post-Closure Corrective Action Monitoring	
GWPP [2]							DOE Order Exit Pathway/Perimeter Monitoring		
						DOE Order Surveillance Monitoring			
Sampling Point [3]	Functional Area [4]	CY 2007 Sampling Date [5]							
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter				
GW-956-2	Y12	.	05/22/07	.	10/29/07	●			
GW-956-3	Y12	.	05/22/07	.	10/29/07	●			
GW-956-4	Y12	.	05/22/07	.	10/29/07	●			
GW-959	B9201-2	.	.	.	11/20/07	●			
GW-960	GRID F2	02/28/07	.	09/10/07	.	●			
GHK2.51WSW	EXP-SW	.	.	.	11/06/07		●		
NPR07.0SW	EXP-SW	.	.	.	11/06/07		●		
NPR12.0SW	EXP-SW	.	.	.	**11/06/07 D**		●		
NPR23.0SW	EXP-SW	.	.	.	11/06/07		●		
200A6	EXP-SW	01/16/07	.	07/11/07	.		**x**		●
SCR7.1SP	EXP-SW	01/18/07	.	.	.		**x**		●
SCR7.8SP	EXP-SW	01/18/07	.	.	.		**x**		●
STATION 8	EXP-SW	01/16/07	.	07/11/07	.		**x**		●

Notes:

1 Groundwater and surface water sampling performed for monitoring programs managed by Bechtel Jacobs Company LLC (BJC).

2 Groundwater and surface water sampling performed for the Y-12 Groundwater Protection Program (GWPP), managed by BWXT Y-12, L.L.C.

x - Denotes the DOE Order monitoring category (surveillance or exit pathway/perimeter) fulfilled by samples collected under programs managed by BJC. Although the CY 2007 samples were collected for various monitoring purposes, all of the data meet DOE Order monitoring requirements. Surveillance and exit pathway/perimeter monitoring data evaluations are provided in Section 4.

3
GHK - Gum Hollow Branch Kilometer (surface water sampling station)
GW - Groundwater Monitoring Well (also locations beginning with numbers)
NPR - North of Pine Ridge near the Scarboro Community (surface water sampling station)
200A6 - Storm drain outfall (surface water sampling station)
SCR - Spring sampling location in Union Valley (prefix)
SP - Spring sampling location (suffix)
STATION - Surface water sampling location in Upper East Fork Poplar Creek
SW - Surface water sampling location (suffix)

Table B.3 (continued)

Notes: (continued)

4	B4	-	Beta-4 Security Pit
	B8110	-	Building 81-10
	B9201-2	-	Building 9201-2
	B9201-5	-	Building 9201-5
	CPT	-	Coal Pile Trench
	EXP-E	-	Exit Pathway Picket E
	EXP-I	-	Exit Pathway Picket I
	EXP-J	-	Exit Pathway Picket J
	EXP-SR	-	Along Scarboro Road in the gap through Pine Ridge
	EXP-SW	-	Surface water or spring sampling station
	EXP-UV	-	East of the Oak Ridge Reservation boundary in Union Valley
	FF	-	Fuel Facility (Building 9754-2)
	FTF	-	Fire Training Facility
	GRID	-	Comprehensive Groundwater Monitoring Plan Grid Location
	NHP	-	New Hope Pond
	RG	-	Rust Garage Area
	S2	-	S-2 Site
	S3	-	S-3 Site
	SY	-	Y-12 Salvage Yard
	T0134	-	Tank 0134-U
	T2331	-	Tank 2331-U
	UOV	-	Uranium Oxide Vault
	WCPA	-	Waste Coolant Processing Area
	Y12	-	Y-12 Complex
5	**.**	-	Not sampled.
	D	-	Duplicate sample collected on specified date (shown in bold typeface).

Table B.4. CY 2007 groundwater and surface water sampling dates in the Chestnut Ridge Hydrogeologic Regime

BJC[1] / GWPP[2] Sampling Point[3]	Functional Area[4]	CY 2007 Sampling Date[5] 1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	DOE Order Surveillance Monitoring	DOE Order Exit Pathway/Perimeter Monitoring	CERCLA ROD (●) and Baseline (○) Monitoring	RCRA Post-Closure Detection (●) and Corrective Action (○) Monitoring	Solid Waste Disposal Facility Detection Monitoring
1090	UNCS	01/31/07	.	07/25/07	.	x		●		
GW-141	LIV	01/11/07	.	07/16/07	.	x				●
GW-143	KHQ	01/08/07	.	.	.	x			●	
GW-144	KHQ	01/04/07	.	.	.	x			●	
GW-145	KHQ	01/08/07	.	.	.	x			●	
GW-156	CRSDB	**01/08/07 D**	.	.	.	x			●	
GW-159	CRSDB	01/08/07	.	.	.	x			●	
GW-161	ECRWP	01/25/07	.	07/10/07	.	x			●	
GW-174	CRSP	.	05/15/07	.	.	●				
GW-176	CRSP	.	05/17/07	.	.	●				
GW-177	CRSP	01/09/07	.	07/11/07	.	x			○	
GW-179	CRSP	.	05/21/07	.	.	●				
GW-180	CRSP	.	**05/16/07 D**	.	.	●				
GW-203	UNCS	01/31/07	.	07/25/07	.	x		●		
GW-205	UNCS	01/31/07	.	07/26/07	.	x		●		
GW-217	LIV	01/10/07	.	07/12/07	.	x				●
GW-221	UNCS	01/31/07	.	07/25/07	.	x		●		
GW-231	KHQ	**01/04/07 D**	.	.	.	x			●	
GW-292	ECRWP	01/23/07	.	07/10/07	.	x			●	
GW-293	ECRWP	**01/24/07 D**	.	**07/10/07 D**	.	x			●	
GW-294	ECRWP	01/22/07	.	07/11/07	.	x			●	
GW-296	ECRWP	01/22/07	.	07/10/07	.	x			●	
GW-298	ECRWP	01/29/07	.	07/09/07	.	x			●	
GW-301	CRBAWP	**01/09/07 D**	.	**07/12/07 D**	.	x			○	
GW-305	LIV	01/10/07	04/30/07	07/12/07	.	x				●
GW-521	LIV	01/10/07	.	07/12/07	.	x				●
GW-522	LIV	01/10/07	.	**07/12/07 D**	.	x				●
GW-540	LII/CDLVI	01/18/07	.	07/18/07	.	x				●
GW-542	CDLVI	**01/17/07 D**	.	**07/18/07 D**	.	x				●
GW-543	CDLVI	01/17/07	.	07/18/07	.	x				●
GW-544	CDLVI	01/18/07	.	07/18/07	.	x				●
GW-557	LV	01/11/07	.	07/16/07	.	x				●
GW-560	CDLVII	01/17/07	.	07/17/07	.	x				●
GW-562	CDLVII	01/16/07	.	07/17/07	.	x				●

Table B.4 (continued)

BJC[1]										Solid Waste Disposal Facility Detection Monitoring
									RCRA Post-Closure Detection (●) and Corrective Action (○) Monitoring	
								CERCLA ROD (●) and Baseline (○) Monitoring		
GWPP[2]							DOE Order Exit Pathway/Perimeter Monitoring			
						DOE Order Surveillance Monitoring				
Sampling Point[3]	Functional Area[4]	CY 2007 Sampling Date[5]								
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter					
GW-564	CDLVII	**01/17/07 D**	.	**07/17/07 D**	.	x				●
GW-612	CRSP	.	05/17/07	.	.	●				
GW-709	LII	01/11/07	.	07/16/07	.	x				●
GW-731	CRSDB	01/09/07	.	.	.	x			●	
GW-732	CRSDB	01/09/07	.	.	.	x			●	
GW-757	LII	01/11/07	.	07/16/07	.	x				●
GW-796	LV/CDLVII	01/16/07	.	07/16/07	.	x				●
GW-797	LV	01/11/07	.	07/17/07	.	x				●
GW-798	CDLVII	01/16/07	.	07/17/07	.	x				●
GW-799	LV	01/16/07	.	07/17/07	.	x				●
GW-801	LV	01/11/07	.	07/16/07	.	x				●
GW-827	CDLVI	01/17/07	.	07/18/07	.	x				●
GW-831	FCAP	01/09/07	.	07/11/07	.	x			○	
MCK 2.0	FCAP	01/23/07	.	07/17/07	.		x	●		
MCK 2.05	FCAP	**01/23/07 D**	.	**07/17/07 D**	.		x	●		
S17	EXP-SW	.	**05/02/07 D**	.	.		●			
SCR1.25SP	EXP-SW	01/23/07	.	07/17/07	.		x	○		
SCR1.5SW	EXP-SW	.	05/02/07	.	.		●			
SCR2.1SP	EXP-SW	.	05/02/07	.	.		●			
SCR2.2SP	EXP-SW	.	05/02/07	.	.		●			
SCR3.5SP	EXP-SW	01/23/07	.	07/17/07	.		x	○		
SCR3.5SW	EXP-SW	.	05/02/07	.	.		●			
SCR4.3SP	EXP-SW	01/16/07	.	07/17/07	.		x			●

Notes:

1 Groundwater and surface water sampling performed under monitoring programs managed by Bechtel Jacobs Company LLC (BJC).

Table B.4 (continued)

Notes: **(continued)**

2 Surface water sampling performed under the Y-12 Groundwater Protection Program (GWPP) managed by BWXT Y-12, L.L.C.

x	-	Denotes the DOE Order monitoring category (site surveillance or exit pathway/perimeter) fulfilled by samples collected under programs managed by BJC. Although the CY 2007 samples were collected for various monitoring purposes, all of the data meet DOE Order monitoring requirements. Surveillance and exit pathway/perimeter monitoring data evaluations are provided in Section 4.

3

GW	-	Groundwater monitoring well (also 1090)
MCK	-	McCoy Branch Kilometer
SCR	-	South Chestnut Ridge (tributary prefix)
SP	-	Spring sampling location (suffix)
SW	-	Surface water sampling location (suffix)

4

CDLVI	-	Construction/Demolition Landfill VI
CDLVII	-	Construction/Demolition Landfill VII
CRBAWP	-	Chestnut Ridge Borrow Area Waste Pile (formerly)
CRSDB	-	Chestnut Ridge Sediment Disposal Basin
CRSP	-	Chestnut Ridge Security Pits
ECRWP	-	East Chestnut Ridge Waste Pile
EXP-SW	-	Exit Pathway (spring or surface water sampling location)
FCAP	-	Filled Coal Ash Pond
KHQ	-	Kerr Hollow Quarry
LII	-	Industrial Landfill II
LIV	-	Industrial Landfill IV
LV	-	Industrial Landfill V
UNCS	-	United Nuclear Corporation Site

5

.	-	Not Sampled.
D	-	Duplicate sample collected on specified date (shown in bold typeface).

Table B.5. Field measurements and laboratory analytes for CY 2007 groundwater and surface water samples obtained by the Y-12 GWPP

Field Measurements	Analytical Method [1]	Reporting Limit [2]	Units [3]
Depth to Water	NA	NA	ft
Water Temperature	NA	NA	Celsius
pH	NA	NA	pH units
Conductivity	NA	NA	µmho/cm
Dissolved Oxygen	NA	NA	ppm
Oxidation-Reduction Potential	NA	NA	mV
Miscellaneous Laboratory Analytes			
Total Dissolved Solids	EPA-160.1	1	mg/L
Total Suspended Solids	EPA-160.2	1	mg/L
Turbidity	EPA-180.1	0.1	NTU
Anions			
Carbonate	EPA-310.1	1.0	mg/L
Bicarbonate	EPA-310.1	1.0	mg/L
Chloride	EPA-300.0	0.2	mg/L
Fluoride	EPA-340.2	0.1	mg/L
Nitrate (as Nitrogen)	EPA-300.0	0.028	mg/L
Sulfate	EPA-300.0	0.25	mg/L
Metals/Cations			
Aluminum	SW846-6010B	0.2	mg/L
Antimony	EPA-200.8	0.0025	mg/L
Arsenic	EPA-200.8	0.005	mg/L
Barium	SW846-6010B	0.004	mg/L
Beryllium	SW846-6010B	0.0005	mg/L
Boron	SW846-6010B	0.1	mg/L
Cadmium	EPA-200.8	0.0025	mg/L
Calcium	SW846-6010B	0.2	mg/L
Chromium	EPA-200.8	0.01	mg/L
Cobalt	SW846-6010B	0.02	mg/L
Copper	SW846-6010B	0.02	mg/L
Iron	SW846-6010B	0.05	mg/L
Lead	EPA-200.8	0.0005	mg/L
Lithium	SW846-6010B	0.01	mg/L
Magnesium	SW846-6010B	0.2	mg/L
Manganese	SW846-6010B	0.005	mg/L
Mercury	SW846-7470	0.0002	mg/L
Molybdenum	SW846-6010B	0.05	mg/L
Nickel	EPA-200.8	0.005	mg/L
Potassium	SW846-6010B	2	mg/L
Selenium	EPA-200.8	0.01	mg/L
Silver	SW846-6010B	0.02	mg/L

Table B.5 (continued)

Metals/Cations (continued)	Analytical Method [1]	Reporting Limit [2]	Units [3]
Sodium	SW846-6010B	0.2	mg/L
Strontium	SW846-6010B	0.005	mg/L
Thallium	EPA-200.8	0.0005	mg/L
Thorium	SW846-6010B	0.2	mg/L
Uranium	EPA-200.8	0.0005	mg/L
Vanadium	SW846-6010B	0.02	mg/L
Zinc	SW846-6010B	0.05	mg/L
Volatile Organic Compounds		**CRQL [4]**	
Acetone	SW846-8260B UP	10	µg/L
Acrolein	SW846-8260B UP	10	µg/L
Acrylonitrile	SW846-8260B UP	5	µg/L
Benzene	SW846-8260B UP	5	µg/L
Bromochloromethane	SW846-8260B UP	5	µg/L
Bromodichloromethane	SW846-8260B UP	5	µg/L
Bromoform	SW846-8260B UP	5	µg/L
Bromomethane	SW846-8260B UP	5	µg/L
2-Butanone	SW846-8260B UP	5	µg/L
Carbon disulfide	SW846-8260B UP	5	µg/L
Carbon tetrachloride	SW846-8260B UP	5	µg/L
Chlorobenzene	SW846-8260B UP	5	µg/L
Chloroethane	SW846-8260B UP	5	µg/L
2-Chloroethyl vinyl ether	SW846-8260B UP	10	µg/L
Chloroform	SW846-8260B UP	5	µg/L
Chloromethane	SW846-8260B UP	5	µg/L
Dibromochloromethane	SW846-8260B UP	5	µg/L
1,2-Dibromo-3-chloropropane	SW846-8260B UP	10	µg/L
1,2-Dibromoethane	SW846-8260B UP	5	µg/L
Dibromomethane	SW846-8260B UP	5	µg/L
1,2-Dichlorobenzene	SW846-8260B UP	5	µg/L
1,4-Dichlorobenzene	SW846-8260B UP	5	µg/L
1,4-Dichloro-2-butene	SW846-8260B UP	5	µg/L
trans-1,4-Dichloro-2-butene	SW846-8260B UP	5	µg/L
Dichlorodifluoromethane	SW846-8260B UP	5	µg/L
1,1-Dichloroethane	SW846-8260B UP	5	µg/L
1,2-Dichloroethane	SW846-8260B UP	5	µg/L
1,1-Dichloroethene	SW846-8260B UP	5	µg/L
cis-1,2-Dichloroethene	SW846-8260B UP	5	µg/L
trans-1,2-Dichloroethene	SW846-8260B UP	5	µg/L
1,2-Dichloropropane	SW846-8260B UP	5	µg/L
cis-1,3-Dichloropropene	SW846-8260B UP	5	µg/L
trans-1,3-Dichloropropene	SW846-8260B UP	5	µg/L

Table B.5 (continued)

Volatile Organic Compounds (cont'd)	Analytical Method[1]	CRQL[4]	Units[3]
1,4-Dioxane	SW846-8260B UP	5	µg/L
Ethanol	SW846-8260B UP	200	µg/L
Ethylbenzene	SW846-8260B UP	5	µg/L
Ethyl methacrylate	SW846-8260B UP	5	µg/L
2-Hexanone	SW846-8260B UP	5	µg/L
Iodomethane	SW846-8260B UP	5	µg/L
Methanol	SW846-8015A	5,000	µg/L
4-Methyl-2-pentanone	SW846-8260B UP	5	µg/L
Methylene chloride	SW846-8260B UP	5	µg/L
Styrene	SW846-8260B UP	5	µg/L
1,1,1,2-Tetrachloroethane	SW846-8260B UP	5	µg/L
1,1,2,2-Tetrachloroethane	SW846-8260B UP	5	µg/L
Tetrachloroethene	SW846-8260B UP	5	µg/L
Toluene	SW846-8260B UP	5	µg/L
1,1,1-Trichloroethane	SW846-8260B UP	5	µg/L
1,1,2-Trichloroethane	SW846-8260B UP	5	µg/L
Trichloroethene	SW846-8260B UP	5	µg/L
Trichlorofluoromethane	SW846-8260B UP	5	µg/L
1,1,2-Trichloro-1,2,2-trifluoroethane	SW846-8260B UP	5	µg/L
1,2,3-Trichloropropane	SW846-8260B UP	10	µg/L
Vinyl acetate	SW846-8260B UP	10	µg/L
Vinyl chloride	SW846-8260B UP	2	µg/L
Total Xylene	SW846-8260B UP	5	µg/L
Radiological Analytes		**Target MDA[5]**	
Gross Alpha Activity	EPA-900.0	3.5	pCi/L
Gross Beta Activity	EPA-900.0	7.0	pCi/L
Technetium-99	Y/P65-7060	10	pCi/L
Uranium-234, 235, & 238	Y/P65-7061	0.4	pCi/L

Notes:

1 NA - not applicable

Analytical methods from:

- *Test Methods for Evaluating Solid Waste Physical/Chemical Methods* (U.S. Environmental Protection Agency 1996)
- *Methods for Chemical Analysis of Water and Wastes* (U.S. Environmental Protection Agency 1983)
- BWXT Y-12 Analytical Chemistry Organization Control Procedures: (Y/P65-7060 and Y/P65-7061)

2 The lowest concentration reported.

NA - not applicable

Table B.5 (continued)

Notes: (continued)

3	ft	-	feet
	µg/L	-	micrograms per liter
	µmho/cm	-	micromhos per centimeter
	mg/L	-	milligrams per liter
	mV	-	millivolts
	NTU	-	nephelometric turbidity units
	ppm	-	parts per million
	pCi/L	-	picoCuries per liter
4	CRQL	-	contract-required quantitation limit; estimated values are reported below this level and above the instrument detection limit. Results below the instrument detection limit are reported as not detected at the CRQL.
5	MDA	-	minimum detectable activity. The target MDA may be obtained under optimal analytical conditions; actual MDAs are sample-specific and, in some cases, may vary significantly from the target value.

Table B.6. Depth-to-water measurements and groundwater elevations in the Bear Creek Hydrogeologic Regime, April 2007

Well Number	Location [1]	Hydrogeologic Unit		Measuring Point [2]	Date Measured	Depth to Water [3]	Groundwater Elevation [4]
		Aquifer	Aquitard				
GW-001	OLF		●	981.00	04/12/07	14.95	966.05
GW-008	OLF		●	965.39	04/12/07	14.30	951.09
GW-010	OLF		●	952.70	04/12/07	3.26	949.44
GW-012	OLF		●	955.57	04/12/07	6.50	949.07
GW-013	OLF		●	965.14	04/12/07	5.93	959.21
GW-014	BG		●	934.50	04/10/07	6.51	927.99
GW-016	BG		●	928.81	04/10/07	10.24	918.57
GW-041	BG		●	1008.10	04/10/07	15.58	992.52
GW-046	BG		●	921.17	04/10/07	3.96	917.21
GW-047	BG		●	929.00	04/10/07	7.80	921.20
GW-052	BG	●		905.70	04/10/07	14.16	891.54
GW-053	BG	●		903.42	04/10/07	8.67	894.75
GW-065	OLF	●		982.50	04/16/07	22.78	959.72
GW-080	BG		●	981.00	04/10/07	21.86	959.14
GW-084	OLF		●	997.18	04/16/07	9.90	987.28
GW-086	OLF		●	982.80	04/16/07	11.66	971.14
GW-090	BG		●	961.88	04/10/07	5.28	956.60
GW-091	BG		●	952.62	04/10/07	7.75	944.87
GW-097	OLF		●	945.41	04/12/07	9.42	935.99
GW-100	S3	●		987.40	04/09/07	5.95	981.45
GW-101	S3		●	1007.40	04/09/07	9.31	998.09
GW-115	S3		●	1055.01	04/10/07	11.57	1043.44
GW-127	S3		●	1005.90	04/09/07	13.84	992.06
GW-236	S3	●		983.21	04/16/07	8.31	974.90
GW-242	BG		●	978.69	04/10/07	5.91	972.78
GW-245	S3		●	1009.08	04/09/07	13.40	995.68
GW-249	BG		●	991.15	04/10/07	35.89	955.26
GW-257	BG		●	961.68	04/10/07	28.81	932.87
GW-276	S3		●	1001.57	04/10/07	6.84	994.73
GW-287	BG		●	927.04	04/10/07	9.29	917.75
GW-289	BG		●	948.73	04/10/07	16.71	932.02
GW-291	BG		●	948.66	04/10/07	11.53	937.13
GW-307	RS	●		993.14	04/09/07	30.45	962.69
GW-309	RS	●		988.17	04/09/07	20.67	967.50
GW-310	RS	●		995.52	04/09/07	21.46	974.06
GW-316	SPI	●		1047.17	04/10/07	57.98	989.19
GW-323	SPI	●		1130.11	04/16/07	85.87	1044.24
GW-325	S3		●	1003.00	04/16/07	7.37	995.63
GW-345	S3		●	999.63	04/16/07	17.00	982.63

Table B.6 (continued)

Well Number	Location [1]	Hydrogeologic Unit		Measuring Point [2]	Date Measured	Depth to Water [3]	Groundwater Elevation [4]
		Aquifer	Aquitard				
GW-347	S3	●		1001.05	04/09/07	17.00	984.05
GW-370	BG		●	960.81	04/10/07	15.04	945.77
GW-372	BG		●	983.16	04/10/07	18.59	964.57
GW-531	LD		●	1004.61	04/16/07	10.63	993.98
GW-537	OLF		●	976.65	04/16/07	5.38	971.27
GW-613	S3		●	1013.58	04/16/07	8.54	1005.04
GW-621	EXP-B	●		925.45	04/16/07	6.60	918.85
GW-622	BG		●	924.16	04/10/07	10.14	914.02
GW-624	BG		●	922.15	04/10/07	10.68	911.47
GW-630	LD		●	986.65	04/16/07	8.73	977.92
GW-638	OLF		●	941.77	04/12/07	5.72	936.05
GW-641	BG		●	946.66	04/12/07	17.85	928.81
GW-642	BG		●	1014.95	04/10/07	18.62	996.33
GW-645	OLF	●		1006.40	04/16/07	64.20	942.20
GW-648	RS	●		1029.20	04/16/07	61.17	968.03
GW-652	BG	●		900.83	04/10/07	9.94	890.89
GW-653	BG		●	931.84	04/10/07	22.78	909.06
GW-654	BG		●	940.79	04/10/07	6.92	933.87
GW-795	AGLLSF		●	926.18	04/12/07	3.10	923.08
GW-835	S3		●	1000.91	04/09/07	14.60	986.31
GW-916	EMWMF		●	1002.85	04/17/07	4.24	998.61
GW-917	EMWMF		●	997.10	04/12/07	22.91	974.19
GW-918	EMWMF		●	1067.96	04/12/07	5.37	1062.59
GW-923	EMWMF		●	1016.73	04/12/07	31.69	985.04
GW-924	EMWMF		●	968.90	04/17/07	6.37	962.53

Notes:

1
- AGLLSF - Above Grade Low-Level Storage Facility
- BG - Bear Creek Burial Grounds Waste Management Area
- EMWMF - Environmental Management Waste Management Facility
- EXP-B - Exit Pathway (Maynardville Limestone) Picket B
- LD - Lysimeter Demonstration Site
- OLF - Oil Landfarm Waste Management Area
- RS - Rust Spoil Area
- SPI - Spoil Area I
- S3 - S-3 Site

2 The measuring point is the surveyed elevation of a mark on either the top of the innermost well casing or the top of dedicated sampling equipment, in feet above mean sea level.

3 The depth to water is in feet below the measuring point.

4 The groundwater elevation (measuring point depth to water) is in feet above mean sea level.

Table B.7. Depth-to-water measurements and groundwater elevations in the Upper East Fork Poplar Creek Hydrogeologic Regime, April 2007

Well Number	Location [1]	Hydrogeologic Unit		Measuring Point [2]	Date Measured	Depth to Water [3]	Groundwater Elevation [4]
		Aquifer	Aquitard				
55-1A	Y12		●	986.91	04/09/07	11.02	975.89
55-3A	Y12		●	972.46	04/09/07	11.75	960.71
55-6A	Y12		●	989.29	04/09/07	10.13	979.16
56-1A	Y12		●	969.25	04/09/07	7.57	961.68
56-2A	Y12		●	963.53	04/09/07	8.78	954.75
56-8A	Y12	●		962.46	04/09/07	20.19	942.27
60-1A	Y12	●		929.66	04/12/07	11.51	918.15
GW-105	S3		●	1018.20	04/10/07	8.28	1009.92
GW-108	S3		●	999.00	04/10/07	7.03	991.97
GW-115	S3		●	1055.01	04/10/07	11.57	1043.44
GW-148	NHP	●		907.76	04/11/07	8.40	899.36
GW-152	NHP	●		921.18	04/11/07	20.07	901.11
GW-154	NHP	●		911.70	04/11/07	9.68	902.02
GW-167	EXP	●		931.95	04/11/07	31.80	900.15
GW-169	EXP-UV	●		932.12	04/11/07	31.25	900.87
GW-192	B4		●	1008.83	04/09/07	5.91	1002.92
GW-193	T2331	●		934.17	04/09/07	9.02	925.15
GW-195	B4		●	1002.90	04/09/07	6.57	996.33
GW-199	GRID I1		●	961.08	04/12/07	17.12	943.96
GW-202	RDS		●	968.02	04/12/07	9.86	958.16
GW-204	T0134		●	958.74	04/09/07	8.69	950.05
GW-219	UOV	●		935.83	04/10/07	10.25	925.58
GW-253	S2	●		1004.24	04/10/07	10.20	994.04
GW-255	S2	●		1027.13	04/10/07	28.18	998.95
GW-261	SY		●	1049.99	04/10/07	18.17	1031.82
GW-263	SY		●	1057.73	04/10/07	29.97	1027.76
GW-334	WC		●	983.73	04/09/07	11.40	972.33
GW-335	WC		●	981.88	04/09/07	9.54	972.34
GW-349	S2	●		993.50	04/09/07	4.66	988.84
GW-380	NHP	●		913.55	04/12/07	10.22	903.33
GW-383	NHP		●	908.77	04/11/07	9.30	899.47
GW-617	EXP-E	●		985.28	04/09/07	13.67	971.61
GW-619	FTF	●		1015.42	04/10/07	25.20	990.22
GW-686	CPT	●		963.76	04/09/07	12.85	950.91
GW-691	CPT	●		968.59	04/09/07	12.35	956.24
GW-696	B8110	●		969.78	04/11/07	31.57	938.21
GW-746	GRID K1		●	906.88	04/11/07	8.03	898.85

Table B.7 (continued)

Well Number	Location [1]	Hydrogeologic Unit		Measuring Point [2]	Date Measured	Depth to Water [3]	Groundwater Elevation [4]
		Aquifer	Aquitard				
GW-752	GRID J3		●	912.78	04/10/07	4.13	908.65
GW-754	GRID J2		●	928.78	04/10/07	10.89	917.89
GW-756	GRID J1		●	928.11	04/10/07	6.00	922.11
GW-759	GRID G1		●	994.01	04/10/07	18.87	975.14
GW-761	GRID G2		●	968.23	04/10/07	10.75	957.48
GW-763	GRID J3		●	915.03	04/12/07	8.96	906.07
GW-765	GRID E1		●	1008.54	04/10/07	19.42	989.12
GW-767	GRID I2		●	948.54	04/12/07	10.46	938.08
GW-770	GRID G3		●	944.72	04/12/07	10.60	934.12
GW-774	GRID H2		●	963.16	04/12/07	9.84	953.32
GW-776	GRID H3		●	931.25	04/12/07	13.08	918.17
GW-783	GRID E3		●	948.49	04/12/07	10.28	938.21
GW-792	GRID D2		●	992.74	04/09/07	25.39	967.35
GW-816	EXP-SR		●	898.42	04/10/07	12.14	886.28
GW-960	GRID F2		●	963.26	04/12/07	12.72	950.54

Notes:

1
B4 - Beta-4 Security Pits
B8110 - Building 81-10
B9201-2 - Building 9201-2
CPT - Coal Pile Trench
EXP-E - Exit Pathway (Maynardville Limestone) monitoring well
EXP-SR - Along Scarboro Road in the gap through Pine Ridge
EXP-UV - Offsite in Union Valley
FTF - Fire Training Facility
GRID - Comprehensive Groundwater Monitoring Plan Grid Location
NHP - New Hope Pond
RDS - Ravine Disposal Site
S2 - S-2 Site
S3 - S-3 Site
SY - Y-12 Plant Salvage Yard
T0134 - Tank 0134-U
T2331 - Tank 2331-U
UOV - Uranium Oxide Vault
WC - Waste Coolant Processing Area
Y12 - Y-12 Complex

3 The measuring point is the surveyed elevation of a mark on either the top of the innermost well casing or the top of dedicated sampling equipment, in feet above mean sea level.

4 The depth to water is in feet below the measuring point.

5 The groundwater elevation (measuring point depth to water) is in feet above mean sea level.

Table B.8. Depth-to-water measurements and groundwater elevations in the Chestnut Ridge Hydrogeologic Regime, April 2007

Well Number	Location [1]	Measuring Point [2]	Date Measured	Depth to Water [3]	Groundwater Elevation [4]
1082	ORSF	837.28	04/09/07	25.24	812.04
1084	ORSF	965.40	04/09/07	63.07	902.33
1090	UNCS	1104.48	04/10/07	55.11	1049.37
GW-141	LIV	1186.23	04/11/07	96.24	1089.99
GW-142	KHQ	971.15	04/16/07	136.72	834.43
GW-144	KHQ	913.54	04/16/07	80.29	833.25
GW-145	KHQ	840.24	04/16/07	5.90	834.34
GW-156	CRSDB	1049.28	04/11/07	143.05	906.23
GW-159	CRSDB	1051.38	04/11/07	117.52	933.86
GW-160	CRBAWP	1093.09	04/11/07	144.22	948.87
GW-173	CRSP	1115.00	04/10/07	149.89	965.11
GW-174	CRSP	1116.66	04/10/07	116.76	999.90
GW-175	CRSP	1084.19	04/10/07	122.11	962.08
GW-176	CRSP	1125.30	04/10/07	116.23	1009.07
GW-177	CRSP	1158.20	04/11/07	117.83	1040.37
GW-178	CRSP	1143.49	04/10/07	91.33	1052.16
GW-179	CRSP	1128.00	04/10/07	116.03	1011.97
GW-180	CRSP	1104.14	04/11/07	116.68	987.46
GW-184	RQ	927.63	04/09/07	110.21	817.42
GW-186	RQ	831.32	04/09/07	14.73	816.59
GW-188	RQ	837.09	04/09/07	20.28	816.81
GW-203	UNCS	1105.45	04/10/07	83.33	1022.12
GW-205	UNCS	1104.14	04/10/07	80.00	1024.14
GW-217	LIV	1177.03	04/10/07	112.18	1064.85
GW-221	UNCS	1106.16	04/10/07	84.68	1021.48
GW-231	KHQ	849.67	04/16/07	14.53	835.14
GW-241	CRSDB	982.84	04/16/07	44.92	937.92
GW-292	ECRWP	1073.00	04/11/07	112.77	960.23
GW-298	CRBAWP	1049.01	04/11/07	109.73	939.28
GW-299	CRBAWP	1053.86	04/11/07	101.70	952.16
GW-300	CRBAWP	1073.12	04/11/07	115.84	957.28
GW-301	CRBAWP	1086.55	04/11/07	135.22	951.33
GW-302	UNCS	1141.84	04/11/07	102.16	1039.68
GW-303	CRSDB	1007.16	04/11/07	87.65	919.51
GW-304	CRSDB	1045.49	04/11/07	117.19	928.30
GW-305	LIV	1183.72	04/16/07	121.82	1061.90
GW-322	CRSP	1134.98	04/10/07	159.20	975.78
GW-339	UNCS	1124.83	04/10/07	77.62	1047.21

Table B.8 (continued)

Well Number	Location [1]	Measuring Point [2]	Date Measured	Depth to Water [3]	Groundwater Elevation [4]
GW-511	CRSP	1093.21	04/10/07	111.77	981.44
GW-512	FCAP	1001.54	04/10/07	26.05	975.49
GW-521	LIV	1182.88	04/16/07	82.33	1100.55
GW-522	LIV	1175.48	04/16/07	103.34	1072.14
GW-539	LII	1093.20	04/16/07	110.21	982.99
GW-541	CDLVI	1058.40	04/16/07	64.17	994.23
GW-542	CDLVI	1051.81	04/16/07	69.90	981.91
GW-543	CDLVI	1024.01	04/16/07	60.64	963.37
GW-544	CDLVI	1045.19	04/16/07	54.66	990.53
GW-546	CDLVI	1072.21	04/16/07	86.09	986.12
GW-557	LV	1081.36	04/12/07	125.21	956.15
GW-558	SSCR	981.42	04/12/07	49.10	932.32
GW-559	SSCR	1102.79	04/12/07	139.50	963.29
GW-560	CDLVII	949.05	04/12/07	51.80	897.25
GW-562	CDLVII	934.69	04/16/07	12.71	921.98
GW-564	CDLVII	938.07	04/12/07	11.38	926.69
GW-608	CRSP	1075.38	04/11/07	138.47	936.91
GW-609	CRSP	1112.31	04/11/07	167.68	944.63
GW-610	CRSP	1059.44	04/10/07	97.72	961.72
GW-611	CRSP	1048.38	04/10/07	103.65	944.73
GW-612	CRSP	1131.03	04/10/07	123.42	1007.61
GW-674	FCAP	883.79	04/09/07	8.18	875.61
GW-676	FCAP	846.50	04/09/07	4.07	842.43
GW-677	FCAP	1030.40	04/10/07	27.76	1002.64
GW-678	FCAP	1000.70	04/10/07	21.39	979.31
GW-679	FCAP	1026.90	04/10/07	52.10	974.80
GW-680	FCAP	1001.50	04/12/07	28.96	972.54
GW-709	LII	906.81	04/16/07	20.35	886.46
GW-731	CRSDB	1049.38	04/11/07	125.21	924.17
GW-732	CRSDB	1064.29	04/11/07	158.00	906.29
GW-743	CRSP	1100.36	04/11/07	136.05	964.31
GW-757	LII	961.64	04/16/07	79.47	882.17
GW-796	LV	1052.62	04/10/07	84.38	968.24
GW-797	LV	1060.00	04/10/07	77.20	982.80
GW-798	CDLVII	1006.00	04/12/07	85.14	920.86
GW-799	LV	981.29	04/12/07	23.84	957.45
GW-801	LV	1097.16	04/12/07	114.95	982.21
GW-827	CDLVI	1051.60	04/16/07	42.58	1009.02
GW-831	FCAP	1091.29	04/10/07	130.60	960.69

Table B.8 (continued)

Notes:

1

CDLVI	-	Construction/Demolition Landfill VI
CDLVII	-	Construction/Demolition Landfill VII
CRBAWP	-	Chestnut Ridge Borrow Area Waste Pile
CRSDB	-	Chestnut Ridge Sediment Disposal Basin
CRSP	-	Chestnut Ridge Security Pits
ECRWP	-	East Chestnut Ridge Waste Pile
FCAP	-	Filled Coal Ash Pond
KHQ	-	Kerr Hollow Quarry
LII	-	Industrial Landfill II
LIV	-	Industrial Landfill IV
LV	-	Industrial Landfill V
ORSF	-	Oak Ridge Sludge Farm
RQ	-	Rogers Quarry
SSCR	-	South Side Chestnut Ridge
UNCS	-	United Nuclear Corporation Site

3 The measuring point is the surveyed elevation of a mark on either the top of the innermost well casing or the top of dedicated sampling equipment, in feet above mean sea level.

4 The depth to water is in feet below the measuring point.

5 The groundwater elevation (measuring point - depth to water) is in feet above mean sea level.

Table B.9 Concentration trends for the principal contaminants detected at CY 2007 sampling locations in the Bear Creek Hydrogeologic Regime

Sampling Location[1]	Hydro. Unit[2]		Contaminant Type and Long-Term Trend[3] (○ = indeterminate, ✚ = increasing, ▼ = decreasing)							
	A Q T	A Q F	Inorganics[4]		VOCs[5]				Radioactivity[6]	
			NO3	U	Ethenes	Ethanes	Methanes	Petrol.	Alpha	Beta
GW-008	●		NA	.	✚	✚	.	.	.	.
GW-014	●		.	.	▼	▼	.	.	Q	.
GW-046	●		NA	.	○	○	○	○	.	.
GW-052		●		▼					▼	
GW-053		●			▼					
GW-071	●		.	.	✚	✚	○	○	.	.
GW-072	●					✚				
GW-077	●		NA	.	.	.	.	.	NA	NA
GW-078	●		NA	.	.	.	.	.	NA	NA
GW-079	●		NA	.	.	.	.	.	NA	NA
GW-080	●		NA	.	.	.	.	.	NA	NA
GW-082	●		.	.	○	○	.	.	.	.
GW-085	●		○	.	.	.	.	.	.	○
GW-089	●		.	.	.	.	.	.	.	.
GW-098	●		.	.	○,▼	.	.	.	.	.
GW-100		●	▼	.	.	.	.	.	.	.
GW-101	●		▼	.	.	.	.	.	.	.
GW-122		●	▼	.	.	.	.	.	.	.
GW-127	●		.	.	.	.	.	.	Q	.
GW-225		●	▼	.	○	.	○	.	.	.
GW-226		●	○	.	○	.	.	.	.	.
GW-229		●	.	✚	✚	○	.	○	✚	✚
GW-236		●	▼	.	.	.	.	.	.	.
GW-246	●		○	○	✚	.	✚	.	○	○
GW-257	●		.	.	○	.	.	.	.	.
GW-276	●		▼	▼	▼	.	.	.	▼	▼
GW-277	●		▼	Q	✚	.	○	.	.	▼
GW-289	●		.	.	○	.	.	.	.	.
GW-307		●		.	▼	.	.	.	.	.
GW-313		●	.	.	○	.	.	.	.	.
GW-315		●	.	.	▼	.	.	.	.	.
GW-363	●		NA	.	.	NA	.	.	NA	NA
GW-368		●	.	.	▼	.	.	.	.	.
GW-369		●	.	.	○	.	.	.	.	.
GW-537	●		○	.	.	.	.	.	.	○
GW-601		●	▼	.	▼	.	.	.	.	.
GW-615	●		○	✚	.	.	○	.	.	○
GW-616	●		○	.	.	.	.	.	.	.

Table B.9 (continued)

Sampling Location [1]	Hydro. Unit [2]		Contaminant Type and Long-Term Trend [3] (○ = indeterminate, ✚ = increasing, ▼ = decreasing)							
			Inorganics [4]		VOCs [5]				Radioactivity [6]	
	AQT	AQF	NO3	U	Ethenes	Ethanes	Methanes	Petrol.	Alpha	Beta
GW-626	●		.	.	✚	✚	✚	✚	.	.
GW-627	●		.	.	✚	✚	.	.	.	.
GW-629	●		.	.	✚	✚	.	✚	Q	.
GW-639	●		NA	.	.	NA	.	.	NA	NA
GW-653	●		.	.	○	.	.	.	.	.
GW-683		●	.	NA	.	.	.	.	.	.
GW-684		●	.	NA	.	.	.	.	.	.
GW-694		●	.	▼	.	.	.	.	▼	.
GW-703		●	○	.	▼	.	.	.	.	.
GW-704		●	▼	.	▼	.	.	.	.	.
GW-706		●	▼	▼	○	.	.	.	○	○
GW-712		●	.	.	.	.	.	.	.	.
GW-713		●	.	.	.	.	.	.	.	.
GW-714		●	.	.	.	.	.	.	.	.
GW-724		●	▼	.	○	.	.	.	.	.
GW-725		●	○	.	○	.	.	.	.	.
GW-738		●	▼	.	▼	.	.	.	.	○
GW-740		●	.	.	▼	.	.	.	.	.
GW-916	●		NA	.	.	NA	.	.	NA	NA
GW-917	●		NA	.	.	NA	.	.	NA	NA
GW-918	●		NA	.	.	NA	.	.	NA	NA
GW-920	●		NA	.	.	NA	.	.	NA	NA
GW-921	●		NA	.	.	NA	.	.	NA	NA
GW-922	●		NA	.	.	NA	.	.	NA	NA
GW-923	●		NA	.	.	NA	.	.	NA	NA
GW-924	●		NA	.	.	NA	.	.	NA	NA
GW-925	●		NA	.	.	NA	.	.	NA	NA
GW-926	●		NA	.	.	NA	.	.	NA	NA
GW-927	●		NA	.	.	NA	.	.	NA	NA
BCK-04.55	.	.	.	.	.	.	.	.	.	.
EMWNT-03A	.	.	NA	.	.	.	.	.	.	.
EMWNT-05	.	.	NA	.	.	.	.	.	.	.
EMW-VWEIR	.	.	NA	.	.	.	.	.	NA	NA
EMW-VWUND	.	.	NA	.	.	NA	.	.	NA	NA
NT-01	.	.	○	○	✚	.	.	.	.	○
NT-03	.	.	.	NA	.	.	.	.	NA	NA
NT-04	.	.	NA	.	○	NA	.	.	NA	NA
NT-07	.	.	.	.	▼	▼	.	.	NA	NA
NT-08	.	.	.	▼	▼	▼	.	.	NA	NA

Sampling Location [1]	Hydro. Unit [2]		Contaminant Type and Long-Term Trend [3] (○ = indeterminate, ✚ = increasing, ▼ = decreasing)							
	AQT	AQF	Inorganics [4]		VOCs [5]				Radioactivity [6]	
			NO3	U	Ethenes	Ethanes	Methanes	Petrol.	Alpha	Beta
SS-4	.	.	○	○	○	.	.	.	○	○
SS-5	.	.	.	.	.	.	.	.	○	○.
SS-6	.	.	.	.	.	.	.	.	.	.

<u>Notes</u>:

1 The exit pathway/perimeter monitoring locations are in bold typeface.

2 Hydrostratigraphic Unit

AQF - Monitored interval in the formations comprising the aquifer
AQT - Monitoring interval in the formations comprising the aquitard

3 Trend types were interpreted from data tables or plots of concentration changes over time.

. - Not a contaminant (criteria defined below, in notes 4, 5, and 6).
NA - Not analyzed
R - Results inconsistent with historical data: elevated alpha activity at GW-014.
○ - Indeterminate trend: insufficient data, fairly stable trend, affected by sampling methods or highly fluctuating with no clear upward or downward trend.
▼ - Generally decreasing trend.
✚ - Generally increasing tend.

4 CY 2007 nitrate (NO3) concentration greater than or equal to 10 mg/L.
Total uranium (U) concentration greater than or equal to 0.03 mg/L.

5 Summed CY 2007 concentration of a VOC group (see below) greater than or equal to 5 µg/L.

Ethenes = Summed chloroethenes (PCE, TCE, 12DCE, 11DCE, 11DCE, vinyl chloride)
Ethanes = Summed chloroethanes (111TCA, 11DCA, chloroethane)
Methanes = Summed chloromethanes (carbon tetrachloride, chloroform, methylene chloride)
Petrol. = Summed petroleum hydrocarbons (benzene, toluene, ethylbenzene, xylene)

6 Maximum CY 2007 gross alpha activity greater than or equal to 15 pCi/L.
Maximum CY 2007 gross beta activity greater than or equal to 50 pCi/L.

Table B.10 Concentration trends for the principal contaminants detected at CY 2007 sampling locations in the Upper East Fork Poplar Creek Hydrogeologic Regime

Sampling Location [1]	Hydro. Unit [2]		Contaminant Type and Long-Term Trend [3] (○ = indeterminate, ✚ = increasing, ▼ = decreasing)							
			Inorganics [4]		VOCs [5]				Radioactivity [6]	
	AQT	AQF	NO3	U	Ethenes	Ethanes	Methanes	Petrol.	Alpha	Beta
55-1A	●		.	.	.	.	.	.	.	.
55-2A	●		○	.	▼	○	.	.	.	.
55-2B	●		✚	.	▼,○	▼	.	.	Q	Q
55-2C	●		✚	.	▼	▼	.	.	.	.
55-3A	●		.	.	○	○	.	.	.	.
55-3B	●		.	.	○	○	.	○	.	.
55-3C	●		.	.	✚	○	.	.	.	.
56-1A	●		.	.	.	.	○	.	.	.
56-2A	●		.	.	▼	.	.	.	.	.
56-2B	●		.	.	○	.	.	.	.	.
56-2C	●		.	.	▼,○	.	.	.	.	.
56-3A	●		.	.	○	.	.	.	.	.
56-3B	●		.	.	○	.	.	.	.	.
56-3C	●		.	.	✚	.	.	.	.	.
56-4A	●		.	.	.	.	.	.	.	.
56-6A	●		.	.	.	.	.	.	.	.
60-1A		●	.	.	.	.	.	.	.	.
GW-105	●		▼	.	.	.	.	.	.	.
GW-106	●		○	.	.	.	.	.	.	.
GW-108	●		▼	.	○	.	○	.	○	✚
GW-109	●		○	.	▼	.	▼	.	.	○
GW-151		●	.	.	✚	.	✚	.	.	.
GW-153		●	.	.	.	.	▼	.	.	.
GW-154		●	NA	○	.	.	.	.	○	▼
GW-169		●	.	NA	.	.	.	.	.	.
GW-170		●	.	NA	.	.	▼	.	.	.
GW-171		●	NA	NA	.	.	.	.	NA	NA
GW-172		●	NA	NA	.	.	.	.	NA	NA
GW-192	●		.	.	○	.	.	.	.	.
GW-193		●	NA	NA	NA	NA	NA	NA	NA	NA
GW-204	●		.	○	.	.	.	.	○	.
GW-219		●	.	○	.	.	.	.	○	○
GW-220		●	.	.	✚	.	✚	.	.	.
GW-223		●	.	✚	✚,▼	.	.	.	.	.
GW-230		●	NA	NA	▼	.	.	.	NA	NA
GW-240		●	.	.	.	.	▼	.	.	.
GW-251		●	▼	.	○	.	○	.	.	.
GW-253		●	○	.	○	.	○	.	▼	.
GW-265	●		.	.	▼	.	.	.	.	.

Table B.10 (continued)

Sampling Location[1]	Hydro. Unit[2]		Contaminant Type and Long-Term Trend[3] (○ = indeterminate, ✚ = increasing, ▼ = decreasing)							
			Inorganics[4]		VOCs[5]				Radioactivity[6]	
	AQT	AQF	NO3	U	Ethenes	Ethanes	Methanes	Petrol.	Alpha	Beta
GW-269	●		.	.	✚	○	.	.	.	.
GW-270	●		▼	.	.	.	.	.	.	.
GW-272	●		✚	✚	.	.	.	.	○	.
GW-273	●		.	.	.	.	.	.	.	.
GW-274	●		▼	.	✚	.	✚	✚	.	○
GW-275	●		○	.	.	.	.	.	.	.
GW-281	●		NA	NA	.	.	.	.	NA	NA
GW-332	●		.	.	▼	▼	.	.	.	.
GW-336	●		.	.	▼	▼	.	.	.	.
GW-337	●		.	.	▼	▼	.	.	.	.
GW-380		●	.	.	.	.	.	.	.	.
GW-381		●	.	.	.	.	▼	.	.	.
GW-382		●	.	.	▼	.	▼	.	.	.
GW-383	●		.	.	○,✚	.	.	.	.	.
GW-505	●		.	.	.	.	.	.	○	.
GW-605		●	.	○	✚	.	✚	.	○	.
GW-606		●	.	.	○	.	▼	.	.	.
GW-618		●	.	.	▼	.	.	.	.	.
GW-620		●	.	.	.	.	.	.	.	.
GW-656	●		.	.	▼	▼	.	.	.	.
GW-658	●		NA	NA	.	○	○	○	NA	NA
GW-686		●	.	.	○	.	.	.	.	.
GW-690		●	.	.	▼	.	.	.	.	.
GW-691		●	.	.	✚	.	.	.	.	.
GW-692		●	.	.	✚	.	.	.	.	.
GW-698		●	○	.	○,✚	.	○	.	Q	.
GW-700		●	.	.	▼	.	.	.	.	.
GW-722-06		●	.	.	.	.	.	.	.	.
GW-722-10		●	.	.	.	.	.	.	.	.
GW-722-14		●	.	.	▼	.	▼	.	.	.
GW-722-17		●	.	.	▼	.	▼	.	.	.
GW-722-20		●	.	.	▼	.	▼	.	.	.
GW-722-22		●	.	.	▼	.	▼	.	.	.
GW-722-26		●	.	.	.	.	.	○	.	.
GW-722-30		●	.	.	.	.	.	.	.	.
GW-722-32		●	.	.	.	.	.	.	.	.
GW-722-33		●	.	.	.	.	.	.	.	.
GW-733		●	NA	NA	.	.	.	.	.	.
GW-735		●	.	.	.	.	.	.	.	.

Table B.10 (continued)

Sampling Location[1]	Hydro. Unit[2]		Contaminant Type and Long-Term Trend[3] (○ = indeterminate, ✚ = increasing, ▼ = decreasing)							
	A Q T	A Q F	Inorganics[4]		VOCs[5]				Radioactivity[6]	
			NO3	U	Ethenes	Ethanes	Methanes	Petrol.	Alpha	Beta
GW-744	●		.	.	.	.	.	.	.	.
GW-747	●		.	.	.	.	.	.	.	.
GW-750	●		.	.	.	.	.	.	.	.
GW-762	●		.	.	✚,○	○	○	.	.	.
GW-763	●		.	.	.	.	.	.	.	.
GW-765	●		.	.	.	.	.	.	.	.
GW-769	●		.	.	✚	.	✚	.	.	.
GW-770	●		.	.	.	.	✚	.	.	.
GW-775	●		.	.	.	.	.	.	.	.
GW-776	●		.	.	.	.	.	.	.	.
GW-779	●		.	.	.	.	.	.	.	.
GW-781	●		.	.	.	.	.	.	.	.
GW-782	●		.	.	○	○	.	.	○	.
GW-783	●		.	.	▼	○	.	.	Q	.
GW-791	●		.	.	○	.	.	.	.	.
GW-792	●		.	.	.	.	.	.	.	.
GW-802	●		NA	NA	.	.	.	.	NA	NA
GW-816	●		.	.	.	.	.	.	.	.
GW-820		●	.	.	○	.	.	.	.	.
GW-832		●	.	.	○	.	▼	.	.	.
GW-954-1	●		.	.	.	.	.	.	.	.
GW-954-2	●		.	.	.	.	.	.	.	.
GW-954-3	●		.	.	▼	.	.	.	.	.
GW-956-1	●		.	.	.	.	.	.	.	.
GW-956-2	●		.	.	▼	.	.	.	.	.
GW-956-3	●		.	.	.	.	.	.	.	.
GW-956-4	●		.	.	.	.	.	.	.	.
GW-959		●	.	.	○	.	.	.	.	.
GW-960	●		.	.	.	.	.	.	.	.
200A6	.	.	NA	○	NA	NA	NA	NA	NA	NA
GHK2.51WSW	.	.	.	.	.	.	.	.	.	.
NPR07.0SW	.	.	.	.	.	.	.	.	.	.
NPR12.0SW	.	.	.	.	.	.	.	.	.	.
NPR23.0SW	.	.	.	.	.	.	.	.	.	.
SCR7.1SP	.	.	NA	NA	.	.	.	.	NA	NA
SCR7.8SP	.	.	NA	NA	.	.	.	.	NA	NA
STATION 8	.	.	NA	○	NA	NA	NA	NA	.	.

Table B.10 (continued)

<u>Notes</u>:

1 The exit pathway/perimeter monitoring locations are in bold typeface.

2 Hydrostratigraphic Unit

AQF - Monitored interval in the formations comprising the aquifer
AQT - Monitored interval in the formations comprising the aquitard

3 Trend types were interpreted from data tables or plots of concentration changes over time.

. - Not a contaminant (criteria defined below, in notes 4, 5, and 6).
NA - Not analyzed
Q - Elevated concentration, unsupported by other samples from the location (suspect data)
○ - Indeterminate trend: insufficient data, fairly stable trend, affected by sampling methods or highly fluctuating with no clear upward or downward trend.
▼ - Generally decreasing trend.
✚ - Generally increasing tend.

4 CY 2007 nitrate (NO3) concentration greater than or equal to 10 mg/L.
Total uranium (U) concentration greater than or equal to 0.03 mg/L.

5 Summed CY 2007 concentration of a solvent group (see below) greater than or equal to 5 µg/L.

Ethenes = Summed chloroethenes (PCE, TCE, 12DCE, 11DCE, 11DCE, vinyl chloride)
Ethanes = Summed chloroethanes (111TCA, 11DCA, chloroethane)
Methanes = Summed chloromethanes (carbon tetrachloride, chloroform, methylene chloride)
Petrol. = Summed petroleum hydrocarbons (benzene, ethylbenzene, toluene, and total xylene)

Note that individual compounds have different long-term concentration trends at wells 55-2B, 56-2C, GW-223, GW-383, and GW-698.

6 Maximum CY 2007 gross alpha activity greater than or equal to 15 pCi/L.
Maximum CY 2007 gross beta activity greater than or equal to 50 pCi/L.

Table B.11 Concentration trends for contaminants detected at CY 2007 sampling locations in the Chestnut Ridge Hydrogeologic Regime

Sampling Location[1]	Contaminant Type and Long-Term Trend[2] (○ = indeterminate, ✚ = increasing, ▼ = decreasing)					
	VOCs[3]				Radioactivity[4]	
	Ethenes	Ethanes	Methanes	Freons	Alpha	Beta
1090	NA	NA	NA	NA	.	.
GW-141	.	.	.	.	.	.
GW-143	.	.	.	NA	.	.
GW-144	.	.	.	NA	.	.
GW-145	.	.	.	NA	.	.
GW-156	NA	NA	NA	NA	NA	NA
GW-159	NA	NA	NA	NA	NA	NA
GW-161	.	.	.	NA	.	.
GW-174	.	.	.	○	.	.
GW-176	▼,✚	▼,✚	.	.	.	.
GW-177	○	▼,✚	.	NA	.	.
GW-179	▼	▼	.	○	.	.
GW-180	▼	.	.	○	.	.
GW-203	NA	NA	NA	NA	.	.
GW-205	NA	NA	NA	NA	.	○
GW-217	.	.	.	.	.	.
GW-221	NA	NA	NA	NA	.	.
GW-231	.	.	.	NA	.	.
GW-292	.	.	.	NA	.	.
GW-293	.	.	.	NA	.	.
GW-294	.	.	.	NA	.	.
GW-296	.	.	.	NA	.	.
GW-298	.	.	.	NA	.	.
GW-301	.	.	.	NA	NA	NA
GW-305	○	✚,○	.	.	.	.
GW-521	.	.	.	.	.	.
GW-522	.	.	.	.	.	.
GW-540	.	.	.	.	.	.
GW-542	.	.	.	.	.	.
GW-543	.	.	.	.	.	.
GW-544	.	.	▼	.	.	.
GW-557	.	.	.	.	.	.
GW-560	.	.	.	.	.	.
GW-562	.	.	.	.	.	.
GW-564	.	.	.	.	.	.
GW-612	▼	▼	.	.	.	.
GW-709	.	.	.	.	.	.
GW-731	NA	NA	NA	NA	NA	NA
GW-732	NA	NA	NA	NA	NA	NA

Table B.11 (continued)

Sampling Location[1]	Contaminant Type and Long-Term Trend[2] (○ = indeterminate, ✚ = increasing, ▼ = decreasing)					
	VOCs[3]				Radioactivity[4]	
	Ethenes	Ethanes	Methanes	Freons	Alpha	Beta
GW-757	.	.	.	.	.	.
GW-796	○	○	.	.	.	.
GW-797	.	.	.	.	.	.
GW-798	○	○	.	○	.	.
GW-799	.	.	.	.	.	.
GW-801	.	.	.	.	.	.
GW-827	.	.	.	.	.	.
GW-831	.	.	.	NA	NA	NA
MCK 2.0	NA	NA	NA	NA	.	.
MCK 2.05	NA	NA	NA	NA	.	.
S17	.	.	.	.	.	.
SCR1.25SP	.	.	.	NA	.	.
SCR1.5SW	.	.	.	.	.	.
SCR2.1SP	.	.	.	.	.	.
SCR2.2SP	.	.	.	.	.	.
SCR3.5SP	.	.	.	NA	.	.
SCR3.5SW	.	.	.	.	.	.
SCR4.3SP	.	.	.	.	.	.

<u>Notes</u>:

1 The exit pathway/perimeter monitoring locations are in bold typeface.

2 Trend types were interpreted from data tables or plots of concentration changes over time.

. - Not a contaminant (criteria defined below, in notes 3 and 4).
NA - Not analyzed
○ - Indeterminate trend: fairly stable trend or insufficient data.
▼ - Generally decreasing trend.
✚ - Generally increasing tend.

3 Summed CY 2007 concentration of a solvent group (see below) greater than 0 µg/L (excluding trace levels of common laboratory reagents).

Ethenes = Summed chloroethenes (PCE, TCE, 12DCE, 11DCE, 11DCE, vinyl chloride)
Ethanes = Summed chloroethanes (111TCA, 11DCA, chloroethane)
Methanes = Summed chloromethanes (carbon tetrachloride, chloroform, methylene chloride)
Freons = Summed chlorofluorocarbons (1,1,2-trichloro-1,2,2-trifluoroethane and trichlorofluoromethane)

Note that individual compounds have different long-term concentration trends at wells GW-176, GW-177, and GW-305.

4 Maximum CY 2007 gross alpha activity greater than or equal to 15 pCi/L.
Maximum CY 2007 gross beta activity greater than or equal to 50 pCi/L.

APPENDIX C

MONITORING WELL CONSTRUCTION DETAILS

EXPLANATION

Hydrogeologic Regime:

BC	-	Bear Creek Hydrogeologic Regime
CR	-	Chestnut Ridge Hydrogeologic Regime
EF	-	Upper East Fork Poplar Creek Hydrogeologic Regime

Location:

B4	-	Beta-4 Security Pits
B8110	-	Building 81-10
B9201-2	-	Building 9201-2
B9201-5	-	Building 9201-5
BG	-	Bear Creek Burial Grounds WMA
CDLVI	-	Construction/Demolition Landfill VI
CDLVII	-	Construction/Demolition Landfill VII
CPT	-	Coal Pile Trench
CRBAWP	-	Chestnut Ridge Borrow Area Waste Pile (former site)
CRSDB	-	Chestnut Ridge Sediment Disposal Basin
CRSP	-	Chestnut Ridge Security Pits
ECRWP	-	East Chestnut Ridge Waste Pile
EMWMF	-	Environmental Management Waste Management Facility
EXP	-	Exit Pathway Monitoring Location: Maynardville Limestone Picket (-A, -B, -C, -E, -I, -J, and -W) Along Scarboro Road in the gap through Pine Ridge (-SR) East of Scarboro Road in Union Valley (-UV)
FCAP	-	Filled Coal Ash Pond
FF	-	Fuel Facility (Building 9754-2)
FTF	-	Fire Training Facility
GRID	-	Comprehensive Groundwater Monitoring Plan Grid Location
KHQ	-	Kerr Hollow Quarry
LII	-	Industrial Landfill II
LIV	-	Industrial Landfill IV
LV	-	Industrial Landfill V
NHP	-	New Hope Pond
OLF	-	Oil Landfarm WMA
RG	-	Rust Garage Area
RS	-	Rust Spoil Area
S2	-	S-2 Site
S3	-	S-3 Site
SPI	-	Spoil Area I
SY	-	Y-12 Salvage Yard
T0134	-	Tank 0134-U
T2331	-	Tank 2331-U, near Building 9201-1
UNCS	-	United Nuclear Corporation Site
UOV	-	Uranium Oxide Vault
WCPA	-	Waste Coolant Processing Area
Y12	-	Y-12 Complex

EXPLANATION (continued)

General Information:

Depth	-	Feet below ground surface (rounded to nearest 0.1 ft)
Coordinates	-	Y-12 grid system (rounded to nearest foot)
Measuring Point	-	Top of well casing (TOC), top of Well Wizard™ (TOWW), or the ground surface (GS)
Elevation	-	Feet above mean sea level (rounded to nearest 0.01 ft)
Tag Depth	-	Depth to the bottom of the well (feet below the TOC), taken from the CY 2003 comprehensive well inspection program
.	-	Not Applicable or not available

Geologic Information (regarding the monitored interval):

Hydrostratigraphic Unit:		
AQF	-	Aquifer (Maynardville Limestone and Knox Group)
AQT	-	Aquitard (other formations of the Conasauga Group)
Geologic Formation:		
OCk	-	Knox Group, undifferentiated
Cc	-	Conasauga Group, undifferentiated
Cm	-	Maryville Limestone
Cn	-	Nolichucky Shale
Cmn	-	Maynardville Limestone
Cpv	-	Pumpkin Valley Shale
Crg	-	Rogersville Shale
Cr	-	Rome Formation
Aquifer Zone:		
BDR	-	Bedrock interval (monitored interval top is in fresh rock)
WT	-	Water table interval (monitored interval top is above fresh rock)
Depth	-	Feet below ground surface (rounded to nearest 0.1 ft)

Conductor (Surface) Casing and Well Casing:

Depth	-	Feet below ground surface (rounded to nearest 0.1 ft)
Diameter	-	Outside or inside dimensions, in inches
PVC40	-	Polyvinyl chloride, schedule 40
SS304	-	Stainless steel, schedule 304
STL	-	Carbon steel
STL/gal	-	Galvanized steel
SF25/SJ55	-	Steel; American Petroleum Institute Grade

EXPLANATION (continued)

Monitored Interval:

Top	-	Depth to top of filter pack or open-hole (feet below ground surface)
Bottom	-	Depth to bottom of filter pack or open-hole (feet below ground surface)
Screen Material:		
PVC/sl	-	PVC, slotted
SS/ppk	-	Stainless steel prepack screen, spiral wound
SS/sl	-	Stainless steel, slotted
SS/sw	-	Stainless steel, spiral wound
Slot Size	-	size of screen or slot openings, in inches

NOTE:

Data compiled from the *Updated Subsurface Data Base for Bear Creek Valley, Chestnut Ridge, and parts of Bethel Valley on the U.S. Department of Energy Oak Ridge Reservation* (BWXT 2003b).

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	1090	55-1A	55-2A	55-2B	55-2C	55-3A	55-3B	55-3C	56-1A	56-2A
Hydrogeologic Regime	CR	EF	EF	EF	EF	EF	EF	EF	EF	EF
Functional Area	UNCS	GRIDB2	GRIDB3	GRIDB3	GRIDB3	B9201-5	B9201-5	B9201-5	Y12	GRIDC3
General Information										
Date Installed	1982	09/09/83	08/08/83	1983	08/22/83	1983	1983	1983	1983	1983
Total Depth Drilled	96.7	19.3	14.1	27.6	75.9	14.3	38.1	77.5	19.0	15.1
East Coordinate	53,853	55,014	55,195	55,199	55,203	55,695	55,699	55,703	56,079	56,229
North Coordinate	28,718	30,470	30,085	30,085	30,085	29,959	29,959	29,959	30,351	29,881
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	1,104.48	986.91	976.74	977.42	977.02	972.46	973.32	974.34	969.25	963.53
Ground Surface Elevation	1,101.58	986.20	976.17	976.17	976.07	971.59	971.57	971.76	968.72	962.52
Tag Depth-(TOC)	98.02	19.22	13.98	27.69	76.00	14.25	37.98	77.43	18.95	15.03
Geologic Information										
Hydrostratigraphic Unit	AQF	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	OCk	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cn
Aquifer Zone	WT	WT	WT	WT	BDR	WT	WT	BDR	WT	WT
Weathered Rock-Depth	.	5.0	11.5	10.0	14.5	7.0	5.0	7.0	2.0	.
Fresh Rock-Depth	.	.	.	.	47.2	.	.	.	.	.
Conductor Casing										
Casing Depth	.	.	.	.	15.5	.	.	.	.	.
Outside Diameter	.	.	.	.	4.5	.	.	.	.	.
Inside Diameter	.	.	.	.	.	.	.	.	.	.
Casing Material	.	.	.	.	STL	.	.	.	.	.
Well Casing										
Borehole Depth	96.7	19.3	14.1	27.6	75.9	14.3	38.1	77.5	19.0	15.1
Borehole Diameter	8	6	6	6	6	6	6	6	6	6
Casing Depth	.	14.3	9.1	22.6	70.9	9.3	33.1	72.5	14.0	10.1
Outside Diameter	6.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Inside Diameter	.	4	4	4	4	4	4	4	4	4
Casing Material	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40
Monitored Interval										
Top-Depth	.	11.3	6.1	19.6	67.9	6.3	30.1	69.5	11.0	7.1
Midpoint-Depth	.	15.3	10.1	23.6	71.9	10.3	34.1	73.5	15.0	11.1
Pump Intake-Depth	84.80	16.30	11.43	25.00	73.30	12.13	33.75	72.42	15.97	12.00
Bottom of Screen-Depth	.	19.3	14.1	27.6	75.9	14.3	38.1	77.5	19.0	15.1
Bottom-Depth	96.7	19.3	14.1	27.6	75.9	14.3	38.1	77.5	19.0	15.1
Top-Elevation	.	974.90	970.07	956.57	908.17	965.29	941.47	902.26	957.72	955.42
Midpoint-Elevation	.	970.90	966.07	952.57	904.17	961.29	937.47	898.26	953.72	951.42
Pump Intake-Elevation	1016.78	969.91	964.74	951.22	902.82	959.46	937.82	899.34	952.75	950.53
Bottom-Elevation	1,004.88	966.90	962.07	948.57	900.17	957.29	933.47	894.26	949.72	947.42
Screen Length	.	5	5	5	5	5	5	5	5	5
Screen Material	PVC/sl	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw
Slot Size	.	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number Hydrogeologic Regime Functional Area	56-2B EF GRIDC3	56-2C EF GRIDC3	56-3A EF Y12	56-3B EF Y12	56-3C EF Y12	56-4A EF Y12	56-6A EF Y12	56-8A EF Y12	60-1A EF Y12	GW-008 BC OLF
General Information										
Date Installed	1983	08/18/83	1983	1983	08/02/83	1983	1983	1983	08/12/83	09/21/83
Total Depth Drilled	38.8	77.3	17.8	33.4	55.5	12.1	21.0	25.6	23.2	25.5
East Coordinate	56,226	56,231	56,453	56,478	56,449	56,802	56,915	56,456	60,200	47,596
North Coordinate	29,884	29,885	29,867	29,866	29,859	29,820	29,783	29,466	29,226	29,783
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	962.45	965.11	963.03	964.33	962.86	962.07	960.28	962.46	929.66	965.39
Ground Surface Elevation	962.21	962.44	962.35	962.74	962.36	960.10	958.12	959.15	929.29	962.11
Tag Depth-(TOC)	38.63	77.03	17.92	30.85	55.35	12.60	20.97	25.44	23.10	26.69
Geologic Information										
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQF	AQF	AQT
Geologic Formation	Cn	Cn	Cn	Cn	Cn	Cn	Cn	Cmn	Cmn	Cn
Aquifer Zone	WT	BDR	WT	WT	BDR	WT	WT	WT	WT	WT
Weathered Rock-Depth	.	11.5	3.5	.	8.0	8.5	.	.	.	0.6
Fresh Rock-Depth	.	17.0	.	.	.	.	.	.	.	.
Conductor Casing										
Casing Depth	.	11.5	.	.	.	.	.	.	.	.
Outside Diameter	.	4.5	.	.	.	.	.	.	.	.
Inside Diameter	.	.	.	.	.	.	.	.	.	.
Casing Material	.	STL	.	.	.	.	.	.	.	.
Well Casing										
Borehole Depth	38.8	77.3	17.8	33.4	55.5	12.1	21.0	25.6	23.2	25.5
Borehole Diameter	6	6	6	6	6	6	6	6	6	4.5
Casing Depth	33.8	72.3	12.8	28.4	50.5	7.1	16.0	20.6	18.2	15.7
Outside Diameter	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	2.37
Inside Diameter	4	4	4	4	4	4	4	4	4	2
Casing Material	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40	SS304
Monitored Interval										
Top-Depth	30.8	69.3	9.8	25.4	47.5	4.1	13.0	17.6	15.2	13.0
Midpoint-Depth	34.8	73.3	13.8	29.4	51.5	8.1	17.0	21.6	19.2	19.3
Pump Intake-Depth	35.80	72.30	14.82	26.91	52.00	9.53	16.34	20.19	20.13	17.70
Bottom of Screen-Depth	38.8	77.3	17.8	33.4	55.5	12.1	21.0	25.6	23.2	20.7
Bottom-Depth	38.8	77.3	17.8	33.4	55.5	12.1	21.0	25.6	23.2	25.5
Top-Elevation	931.41	893.14	952.55	937.34	914.86	956.00	945.12	941.55	914.09	949.11
Midpoint-Elevation	927.41	889.14	948.55	933.34	910.86	952.00	941.12	937.55	910.09	942.86
Pump Intake-Elevation	926.45	890.11	947.53	935.83	910.36	950.57	941.78	938.96	909.16	944.39
Bottom-Elevation	923.41	885.14	944.55	929.34	906.86	948.00	937.12	933.55	906.09	936.61
Screen Length	5	5	5	5	5	5	5	5	5	5
Screen Material	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-014	GW-046	GW-052	GW-053	GW-071	GW-072	GW-077	GW-078	GW-079	GW-080
Hydrogeologic Regime	BC	BC	BC	BC	BC	BC	BC	BC	BC	BC
Functional Area	BG	BG	BG	BG	BG	BG	BG	BG	BG	BG
General Information										
Date Installed	09/29/83	10/27/83	11/02/83	11/04/83	03/25/84	03/30/84	03/29/84	03/30/84	03/23/84	03/24/84
Total Depth Drilled	13.2	20.5	19.5	39.7	220.6	101.4	100.5	21.1	65.0	30.0
East Coordinate	44,308	43,284	43,478	43,086	44,191	44,159	41,234	41,209	41,616	41,621
North Coordinate	29,848	29,562	29,052	29,066	29,495	29,502	29,729	29,730	30,630	30,622
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	934.50	921.17	905.70	903.42	928.90	930.51	919.30	918.10	981.20	981.00
Ground Surface Elevation	931.50	918.13	903.40	900.50	925.40	926.30	914.70	914.50	977.20	977.10
Tag Depth-(TOC)	14.50	23.85	22.04	35.13	218.40	101.99	104.10	23.40	64.70	33.00
Geologic Information										
Hydrostratigraphic Unit	AQT	AQT	AQF	AQF	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	Cn	Cn	Cmn	Cmn	Cn	Cn	Cn	Cn	Crg	Crg
Aquifer Zone	WT	WT	WT	WT	BDR	BDR	BDR	BDR	BDR	WT
Weathered Rock-Depth	4.0	7.7	.	4.0	5.5	5.0	7.0	6.5	4.0	3.5
Fresh Rock-Depth	.	.	.	.	16.0	34.0	13.0	8.5	26.5	23.5
Conductor Casing										
Casing Depth	.	.	.	6.0	16.0	13.2	35.0	.	.	.
Outside Diameter	.	.	.	6.5	10.63	10.63	4.5	.	.	.
Inside Diameter	.	.	.	.	10	10	4	.	.	.
Casing Material	.	.	NONE	STL	PVC40	PVC40	STL	.	.	.
Well Casing										
Borehole Depth	13.2	20.5	19.5	39.7	220.6	101.4	100.5	21.1	65.0	30.0
Borehole Diameter	6	6	6	4	8.75	8.75	3.88	6.5	6.5	6.5
Casing Depth	10.0	8.1	13.3	26.6	198.4	87.8	90.3	16.1	59.9	24.7
Outside Diameter	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37
Inside Diameter	2	2	2	2	2	2	2	2	2	2
Casing Material	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	5.0	5.0	4.0	11.4	195.1	84.5	87.4	11.7	49.9	20.8
Midpoint-Depth	9.1	12.7	11.8	22.1	207.1	91.5	93.9	16.4	57.4	25.3
Pump Intake-Depth	9.00	12.00	886.20	871.42	208.50	832.51	.	.	61.80	.
Bottom of Screen-Depth	12.0	18.1	18.3	31.6	219.0	98.4	100.3	21.1	64.9	29.7
Bottom-Depth	13.2	20.3	19.5	32.8	219.0	98.4	100.3	21.1	64.9	29.7
Top-Elevation	926.50	913.13	899.40	889.10	730.30	841.80	827.30	902.80	927.30	956.30
Midpoint-Elevation	922.40	905.48	891.65	878.40	718.35	834.85	820.85	898.10	919.80	951.85
Pump Intake-Elevation	922.50	906.17	17.20	29.08	716.90	93.79	.	.	915.40	.
Bottom-Elevation	918.30	897.83	883.90	867.70	706.40	827.90	814.40	893.40	912.30	947.40
Screen Length	2	10	5	5	20.6	10.6	10	5	5	5
Screen Material	SS/sw	SS/sw	SLS/SW	SLS/SW	SS/sw	SLS/SW	SS/sw	SS/sw	SS/sw	SS/sw
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-082	GW-085	GW-089	GW-098	GW-100	GW-101	GW-105	GW-106	GW-108	GW-109
Hydrogeologic Regime	BC	BC	BC	BC	BC	BC	EF	EF	EF	EF
Functional Area	BG	OLF	BG	OLF	S3	S3	S3	S3	S3	S3
General Information										
Date Installed	03/17/84	03/22/84	1984	09/21/84	09/12/84	09/12/84	09/18/84	09/26/84	09/26/84	09/27/84
Total Depth Drilled	35.0	62.0	25.0	104.0	20.7	17.5	17.0	75.0	58.6	147.6
East Coordinate	42,090	49,058	43,406	46,959	50,957	51,844	52,833	52,843	53,207	53,207
North Coordinate	30,434	30,003	30,924	29,452	29,759	30,241	30,417	30,418	30,070	30,056
Measuring Point	TOWW	TOWW	TOC	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	964.00	983.57	964.36	945.95	987.40	1,007.40	1,018.20	1,016.92	999.00	997.82
Ground Surface Elevation	960.52	979.80	962.48	942.40	984.60	1,005.10	1,014.30	1,014.50	995.80	995.30
Tag Depth-(TOC)	38.45	62.34	27.97	105.65	17.87	19.18	19.40	74.10	58.30	125.45
Geologic Information										
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQF	AQT	AQT	AQT	AQT	AQT
Geologic Formation	Cm	Cn	Crt	Cn	Cmn	Cn	Cn	Cn	Cn	Cn
Aquifer Zone	BDR	BDR	WT	BDR	WT	WT	WT	BDR	BDR	BDR
Weathered Rock-Depth	7.0	2.0	.	1.0	14.0	14.0	10.0	12.5	4.0	5.0
Fresh Rock-Depth	23.0	40.0	.	7.5	.	17.5	.	.	.	16.0
Conductor Casing										
Casing Depth	25.0	.	.	20.0	0.3	2.7	2.5	20.0	20.7	20.0
Outside Diameter	6.5	.	.	10.63	7	7	7	10.63	10.63	10.63
Inside Diameter	.	.	.	10	.	.	.	10	10	10
Casing Material	STL	.	NONE	PVC40	S/GAL	S/GAL	S/GAL	PVC40	PVC40	PVC40
Well Casing										
Borehole Depth	35.0	62.0	25.0	104.0	20.7	17.5	17.0	75.0	58.6	147.6
Borehole Diameter	4	4	6.5	9	6.5	6.5	6.5	9	9	9
Casing Depth	29.4	53.8	23.0	82.4	10.2	12.3	12.1	61.9	46.7	102.9
Outside Diameter	2.37	2.37	2.37	4.5	2.37	2.37	2.37	4.5	4.5	4.5
Inside Diameter	2	2	.	4	2	2	2	4	4	4
Casing Material	SS304	SS304	SS304	SS304	PVC	PVC	PVC	PVC	PVC40	PVC40
Monitored Interval										
Top-Depth	24.1	48.4	20.0	76.6	3.8	10.1	9.5	53.3	41.0	96.6
Midpoint-Depth	29.3	53.6	22.5	90.3	12.3	13.8	13.3	64.2	49.8	112.6
Pump Intake-Depth	31.50	51.20	.	96.40	.	989.40	14.60	67.58	49.80	113.50
Bottom of Screen-Depth	34.4	58.8	25.0	103.4	14.2	16.3	16.1	70.9	55.7	121.9
Bottom-Depth	34.4	58.8	25.0	104.0	20.7	17.5	17.0	75.0	58.6	128.5
Top-Elevation	936.42	931.40	942.48	865.80	980.80	995.00	1,004.80	961.20	954.80	898.70
Midpoint-Elevation	931.27	926.20	939.98	852.10	972.35	991.30	1,001.05	950.35	946.00	882.75
Pump Intake-Elevation	929.00	928.57	.	845.95	.	15.70	999.70	946.92	946.00	881.82
Bottom-Elevation	926.12	921.00	937.48	838.40	963.90	987.60	997.30	939.50	937.20	866.80
Screen Length	5	5	2	21	4	4	4	9	9	19
Screen Material	SS/sw	SS/sw	SLS/SW	SS/sw	PVC/SW	PVC/SW	PVC/sl	PVC/sl	PVC/sl	PVC/sl
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-122	GW-127	GW-141	GW-143	GW-144	GW-145	GW-151	GW-153	GW-154	GW-156
Hydrogeologic Regime	BC	BC	CR	CR	CR	CR	EF	EF	EF	CR
Functional Area	S3	S3	LIV	KHQ	KHQ	KHQ	NHP	NHP	NHP	CRSDB
General Information										
Date Installed	07/25/85	1984	09/04/87	10/24/85	10/24/85	10/14/85	08/14/85	10/31/85	07/30/85	10/18/85
Total Depth Drilled	142.0	24.0	156.0	253.0	195.0	110.0	96.5	60.0	11.2	157.6
East Coordinate	51,807	51,828	52,463	63,522	63,502	63,266	64,232	63,728	63,346	64,020
North Coordinate	29,741	29,850	28,755	24,257	24,255	24,441	28,958	28,613	28,987	27,626
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	1,007.20	1,005.90	1,186.23	913.98	913.54	840.24	916.17	921.68	911.70	1,049.28
Ground Surface Elevation	1,004.15	1,003.67	1,183.45	911.04	910.48	837.29	913.06	918.53	908.60	1,046.94
Tag Depth-(TOC)	145.28	26.52	158.81	252.70	194.34	113.49	99.63	60.84	13.35	157.65
Geologic Information										
Hydrostratigraphic Unit	AQF	AQT	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	Cmn	Cn	OCk	OCk	OCk	OCk	Cmn	Cmn	Cmn	OCk
Aquifer Zone	BDR	WT	BDR	BDR	BDR	BDR	BDR	BDR	WT	BDR
Weathered Rock-Depth	.	.	.	.	.	.	.	.	11.2	84.0
Fresh Rock-Depth	37.0	.	57.0	18.0	40.0	12.0	12.0	14.0	.	93.0
Conductor Casing										
Casing Depth	39.0	.	65.0	20.0	40.0	12.0	12.0	29.0	.	94.0
Outside Diameter	10.75	.	10.75	10.63	12.5	12.5	12.5	10.63	.	10.75
Inside Diameter	10	.	10	9.87	11.75	11.75	11.75	9.88	.	10
Casing Material	SF25	SLS	SF25	PVC40	PVC40	PVC40	PVC40	PVC40	.	SF25
Well Casing										
Borehole Depth	92.0	24.0	156.0	205.0	195.0	110.0	96.5	60.0	11.2	157.0
Borehole Diameter	9.79	6.5	10	10	11	11	11	11	8	8.5
Casing Depth	92.0	18.8	144.5	205.0	150.0	88.5	86.0	49.5	5.7	147.0
Outside Diameter	4.5	2.37	4.5	6.62	4.5	4.5	4.5	4.5	4.5	4.5
Inside Diameter	4	2	4	6.12	4	4	4	4	4	4
Casing Material	SF25	SS304	SS304	SF25	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40
Monitored Interval										
Top-Depth	92.0	14.0	141.0	205.0	148.0	86.0	85.0	45.0	4.7	145.0
Midpoint-Depth	117.0	19.0	148.5	229.0	171.5	98.0	90.8	52.5	8.0	151.3
Pump Intake-Depth	131.90	981.40	147.70	226.10	170.90	100.00	90.80	52.90	8.40	150.70
Bottom of Screen-Depth	.	22.8	155.2	.	190.0	108.5	96.0	59.5	10.7	157.0
Bottom-Depth	142.0	24.0	156.0	253.0	195.0	110.0	96.5	60.0	11.2	157.6
Top-Elevation	912.15	989.67	1,042.45	706.04	762.48	751.29	828.06	873.53	903.90	901.94
Midpoint-Elevation	887.15	984.67	1,034.95	682.04	738.98	739.29	822.31	866.03	900.65	895.64
Pump Intake-Elevation	872.20	22.27	1035.73	684.98	739.54	737.24	822.27	865.68	900.20	896.28
Bottom-Elevation	862.15	979.67	1,027.45	658.04	715.48	727.29	816.56	858.53	897.40	889.34
Screen Length	.	4	10.7	.	40	20	10	10	5	10
Screen Material	.	PVC/SL	SS/sw	.	PVC/sl	PVC/sl	PVC/sl	PVC/sl	PVC/sl	PVC/sl
Slot Size	.	0.01	0.01	.	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	50	.	.	48	.	.	.	.	.	.
Open-Hole Diameter	4	.	.	6	.	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number Hydrogeologic Regime Functional Area	GW-159 CR CRSDB	GW-161 CR ECRWP	GW-169 EF EXP-UV	GW-170 EF EXP-UV	GW-171 EF EXP-UV	GW-172 EF EXP-UV	GW-174 CR CRSP	GW-176 CR CRSP	GW-177 CR CRSP	GW-179 CR CRSP
General Information										
Date Installed	10/18/85	07/07/87	09/16/86	04/01/86	02/26/86	05/05/86	08/15/85	08/27/85	10/24/85	12/03/85
Total Depth Drilled	157.0	400.0	34.8	156.9	31.2	133.9	145.0	145.0	145.0	117.0
East Coordinate	63,496	62,146	66,854	66,843	69,654	69,579	59,215	58,450	57,497	58,569
North Coordinate	27,764	27,805	28,545	28,545	28,403	28,358	28,205	28,294	28,483	28,522
Measuring Point	TOWW	TOC	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	1,051.38	1,093.54	932.12	932.64	920.72	926.69	1,116.66	1,125.30	1,158.20	1,128.00
Ground Surface Elevation	1,048.79	1,090.91	929.95	930.70	918.55	922.85	1,114.06	1,122.13	1,155.52	1,124.33
Tag Depth-(TOC)	155.87	402.88	36.23	156.16	32.64	137.50	151.94	147.33	150.69	122.50
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	OCk	OCk	Cmn	Cmn	Cmn	Cmn	OCk	OCk	OCk	OCk
Aquifer Zone	BDR	BDR	WT	BDR	WT	BDR	BDR	BDR	BDR	WT
Weathered Rock-Depth	.	65.0	.	.	.	15.0	51.0	.	62.0	.
Fresh Rock-Depth	100.0	95.5	.	30.0	.	19.0	80.0	84.0	98.0	.
Conductor Casing										
Casing Depth	123.0	108.0	.	30.0	.	35.0	80.0	88.0	82.0	76.0
Outside Diameter	10.75	12.5	.	8.63	.	8.63	10.75	10.75	10.75	10.75
Inside Diameter	10	.	.	.	.	.	10	10	10	10
Casing Material	SF25	SF25	.	PVC40	.	SF25	SF25	SF25	SF25	SF25
Well Casing										
Borehole Depth	157.0	350.0	42.0	104.0	31.2	105.0	145.0	145.0	145.0	117.0
Borehole Diameter	8.5	11	8	6.62	8	6.62	10	10	8	8
Casing Depth	147.0	350.0	29.7	104.0	26.8	105.0	135.0	135.0	133.0	107.0
Outside Diameter	4.5	6.62	2.37	4.38	2.37	4.38	4.5	4.5	4.5	4.5
Inside Diameter	4	.	2	4	2	4	4	4	4	4
Casing Material	PVC40	SF25	PVC40	STL	PVC40	STL	SS304	SS304	PVC40	SS304
Monitored Interval										
Top-Depth	145.0	350.0	28.7	104.0	25.8	105.0	134.0	134.0	130.0	106.0
Midpoint-Depth	151.0	375.0	31.8	130.5	28.5	119.4	139.5	139.5	137.5	111.5
Pump Intake-Depth	148.40	.	.	124.10	.	123.20	969.66	983.30	.	1,008.50
Bottom of Screen-Depth	157.0	.	34.7	.	31.2	.	145.0	145.0	143.0	117.0
Bottom-Depth	157.0	400.0	34.8	156.9	31.2	133.8	145.0	145.0	145.0	117.0
Top-Elevation	903.79	740.91	901.25	826.70	892.75	817.85	980.06	988.13	1,025.52	1,018.33
Midpoint-Elevation	897.79	715.91	898.20	800.25	890.05	803.45	974.56	982.63	1,018.02	1,012.83
Pump Intake-Elevation	900.38	.	.	806.64	.	799.69	144.40	138.83	.	115.83
Bottom-Elevation	891.79	690.91	895.15	773.80	887.35	789.05	969.06	977.13	1,010.52	1,007.33
Screen Length	10	.	5	.	4.4	.	10	10	10	10
Screen Material	PVC/sl	.	PVC/sl	.	PVC/sl	.	SLS/SW	SLS/SW	PVC/sl	SLS/SW
Slot Size	0.01	.	0.01	.	0.01	.	0.01	0.01	0.01	0.01
Open-Hole Length	.	50	.	52.9	.	28.8	.	.	.	.
Open-Hole Diameter	.	11	.	3.88	.	3.63	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-180	GW-192	GW-193	GW-203	GW-204	GW-205	GW-217	GW-219	GW-220	GW-221
Hydrogeologic Regime	CR	EF	EF	CR	EF	CR	CR	EF	EF	CR
Functional Area	CRSP	B4	T2331	UNCS	T0134	UNCS	LIV	UOV	NHP	UNCS
General Information										
Date Installed	08/11/87	09/30/85	08/04/89	10/24/85	08/30/89	10/25/85	08/13/87	07/30/87	08/22/85	10/24/85
Total Depth Drilled	144.0	17.5	18.5	156.0	17.5	164.0	180.0	11.3	45.2	158.0
East Coordinate	59,220	54,277	59,536	54,190	57,411	54,008	53,020	58,929	64,225	54,389
North Coordinate	28,494	30,772	29,344	28,356	29,956	28,363	28,758	29,163	28,949	28,359
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	1,104.14	1,008.83	934.17	1,105.45	958.74	1,104.14	1,177.03	935.83	915.64	1,106.16
Ground Surface Elevation	1,101.43	1,006.04	931.11	1,102.34	955.47	1,101.46	1,174.29	931.27	912.74	1,103.36
Tag Depth-(TOC)	146.08	21.58	21.17	157.61	20.23	165.13	179.13	15.59	49.00	159.34
Geologic Information										
Hydrostratigraphic Unit	AQF	AQT	AQF	AQF	AQT	AQF	AQF	AQF	AQF	AQF
Geologic Formation	OCk	Cm	Cmn	OCk	Cc	OCk	OCk	Cmn	Cmn	OCk
Aquifer Zone	BDR	WT	WT	BDR	WT	BDR	BDR	WT	BDR	BDR
Weathered Rock-Depth	58.0	17.5	2.5	86.0	10.0	100.0	55.0	.	.	36.0
Fresh Rock-Depth	90.0	.	.	93.0	.	146.0	75.0	.	11.0	90.0
Conductor Casing										
Casing Depth	90.6	.	5.0	94.0	.	154.0	81.7	.	13.0	92.0
Outside Diameter	10.75	.	9.63	10.75	.	10.75	10.75	.	12.5	6.63
Inside Diameter	10	.	.	10	.	10	10	.	11.75	.
Casing Material	SF25	.	STL	SF25	.	SF25	SF25	NONE	PVC40	SF25
Well Casing										
Borehole Depth	144.0	17.5	18.5	156.0	17.5	164.0	180.0	11.3	45.2	158.0
Borehole Diameter	10	6	8	8.5	6	10	10	10	11	6
Casing Depth	132.2	7.5	8.2	146.0	7.3	154.0	166.8	5.7	34.7	148.0
Outside Diameter	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Inside Diameter	4	4	4	4	4	4	4	4	4	4
Casing Material	SS304	PVC40	SS304	PVC40	SS304	PVC40	SS304	SS304	PVC40	PVC40
Monitored Interval										
Top-Depth	126.0	6.5	5.5	144.0	6.5	152.0	165.2	4.3	31.0	146.0
Midpoint-Depth	135.0	12.0	12.0	150.0	11.9	158.0	172.6	7.8	38.1	152.0
Pump Intake-Depth	963.14	12.70	13.90	146.90	11.70	147.30	172.10	922.33	41.10	149.20
Bottom of Screen-Depth	143.0	17.5	18.5	156.0	17.3	164.0	177.4	11.3	44.7	158.0
Bottom-Depth	144.0	17.5	18.5	156.0	17.3	164.0	180.0	11.3	45.2	158.0
Top-Elevation	975.43	999.54	925.61	958.34	948.97	949.46	1,009.09	926.97	881.74	957.36
Midpoint-Elevation	966.43	994.04	919.14	952.34	943.57	943.46	1,001.69	923.47	874.64	951.36
Pump Intake-Elevation	138.29	993.33	917.17	955.45	943.74	954.14	1002.23	8.94	871.64	954.16
Bottom-Elevation	957.43	988.54	912.66	946.34	938.17	937.46	994.29	919.97	867.54	945.36
Screen Length	10.8	10	10.3	10	10	10	10.6	5.6	10	10
Screen Material	SLS/SW	PVC/sl	SS/sw	PVC/sl	SS/sw	PVC/sl	SS/sw	SLS/SW	PVC/sl	PVC/sl
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number Hydrogeologic Regime Functional Area	GW-223 EF NHP	GW-225 BC OLF	GW-226 BC OLF	GW-229 BC OLF	GW-230 EF EXP-UV	GW-231 CR KHQ	GW-236 BC S3	GW-240 EF NHP	GW-246 BC S3	GW-251 EF S2
General Information										
Date Installed	08/21/85	10/08/85	10/14/85	10/30/85	05/12/86	10/02/85	10/16/85	10/31/85	03/11/86	04/08/86
Total Depth Drilled	90.5	200.0	55.0	55.0	406.4	35.0	18.5	29.5	76.0	51.0
East Coordinate	63,311	47,461	47,473	47,017	69,617	63,410	50,453	63,726	52,098	53,843
North Coordinate	28,938	29,155	29,156	29,256	28,388	24,725	29,712	28,604	29,992	29,467
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	911.62	943.11	943.57	949.00	923.11	849.67	983.21	922.90	1,009.19	1,003.80
Ground Surface Elevation	908.97	940.21	940.56	945.71	919.57	846.90	980.39	919.50	1,006.07	1,001.60
Tag Depth-(TOC)	93.57	203.30	58.47	51.45	409.48	37.70	21.14	32.55	76.50	50.04
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQT	AQF
Geologic Formation	Cmn	Cmn	Cmn	Cmn	Cmn	OCk	Cmn	Cmn	Cn	Cmn
Aquifer Zone	BDR	BDR	BDR	BDR	BDR	BDR	WT	BDR	WT	BDR
Weathered Rock-Depth	.	.	.	.	19.0	.	9.0	.	26.0	32.5
Fresh Rock-Depth	10.0	25.0	26.0	30.0	38.0	10.5	18.5	14.0	.	.
Conductor Casing										
Casing Depth	11.0	32.0	30.0	37.0	31.0	11.0	.	14.0	27.0	.
Outside Diameter	12.5	10.75	10.75	10.75	8.63	10.63	.	12.5	12.5	.
Inside Diameter	11.75	10	10	10	.	10	.	12	12	.
Casing Material	PVC40	STL	STL	STL	STL	PVC40	NONE	PVC40	PVC40	.
Well Casing										
Borehole Depth	90.5	150.0	45.0	40.0	341.0	35.0	18.5	29.5	76.0	51.0
Borehole Diameter	11	10	10	10	5.5	11	8	11	11	8.25
Casing Depth	80.0	150.0	45.0	40.0	341.0	24.5	13.0	24.0	46.5	37.5
Outside Diameter	4.5	4.5	4.5	4.5	4.38	4.5	4.5	4.5	6.5	4.5
Inside Diameter	4	4	4	4	4	4	.	4	6	4
Casing Material	PVC40	STL	STL	STL	STL	PVC40	PVC40	PVC40	PVC40	PVC40
Monitored Interval										
Top-Depth	79.0	150.0	45.0	40.0	341.0	22.8	10.0	21.0	34.2	35.0
Midpoint-Depth	84.8	175.0	50.0	47.5	373.7	28.9	14.3	25.3	55.1	43.0
Pump Intake-Depth	84.40	190.10	49.80	44.70	383.50	28.70	964.71	26.60	59.40	42.80
Bottom of Screen-Depth	90.0	.	.	.	.	34.5	18.0	29.0	74.6	47.1
Bottom-Depth	90.5	200.0	55.0	55.0	406.4	35.0	18.5	29.5	76.0	51.0
Top-Elevation	829.97	790.21	895.56	905.71	578.57	824.10	970.39	898.50	971.87	966.60
Midpoint-Elevation	824.22	765.21	890.56	898.21	545.87	818.00	966.14	894.25	950.97	958.60
Pump Intake-Elevation	824.62	750.11	890.77	901.00	536.11	818.17	15.68	892.90	946.69	958.80
Bottom-Elevation	818.47	740.21	885.56	890.71	513.17	811.90	961.89	890.00	930.07	950.60
Screen Length	10	.	.	.	.	10	5	5	28.1	9.6
Screen Material	PVC/sl	.	.	.	.	PVC/sl	PVC/SW	PVC/sl	PVC/sl	PVC/sl
Slot Size	0.01	.	.	.	.	0.01	0.01	0.01	0.03	0.01
Open-Hole Length	.	50	10	15	65.4	.	.	.	.	.
Open-Hole Diameter	.	4	4	4	3.63	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-253	GW-257	GW-265	GW-269	GW-270	GW-272	GW-273	GW-274	GW-275	GW-276
Hydrogeologic Regime	EF	BC	EF	EF	EF	EF	EF	EF	EF	BC
Functional Area	S2	BG	SY	SY	SY	SY	SY	SY	SY	S3
General Information										
Date Installed	04/11/86	03/03/87	06/16/86	06/16/86	06/09/86	06/16/86	06/09/86	06/09/86	05/30/86	07/15/86
Total Depth Drilled	50.0	33.7	23.1	30.0	18.5	16.2	33.1	35.0	65.5	18.5
East Coordinate	54,057	43,230	53,308	53,779	53,236	53,737	53,261	53,673	53,688	52,557
North Coordinate	29,404	30,148	30,763	30,649	30,424	30,485	30,201	30,152	30,151	29,926
Measuring Point	TOWW	TOWW	TOC	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	1,004.24	961.68	1,032.68	1,027.81	1,008.96	1,009.16	1,003.52	995.60	995.53	1,001.57
Ground Surface Elevation	1,001.60	959.21	1,030.85	1,025.38	1,006.35	1,006.62	1,001.34	992.94	993.08	998.70
Tag Depth-(TOC)	50.51	36.63	25.68	33.50	21.50	19.16	35.00	36.12	68.47	21.34
Geologic Information										
Hydrostratigraphic Unit	AQF	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	Cmn	Cm	Cm	Cm	Cn	Cn	Cn	Cn	Cn	Cn
Aquifer Zone	WT	WT	WT	WT	BDR	WT	WT	WT	BDR	WT
Weathered Rock-Depth	.	.	10.0	10.0	5.0	5.0	5.0	3.0	5.0	18.5
Fresh Rock-Depth	.	33.7	22.0	.	11.0	15.0	.	35.0	35.0	.
Conductor Casing										
Casing Depth	.	.	.	.	.	.	.	.	38.0	.
Outside Diameter	.	.	.	.	.	.	.	.	10.63	.
Inside Diameter	.	.	.	.	.	.	.	.	10	.
Casing Material	.	.	.	.	NONE	NONE	NONE	.	PVC40	.
Well Casing										
Borehole Depth	50.0	33.7	23.1	30.0	18.5	16.2	33.1	35.0	65.5	18.5
Borehole Diameter	8.25	9	10	10	10	10	10	8	10	8
Casing Depth	37.0	23.0	17.5	23.7	13.0	10.9	27.8	28.5	54.8	13.0
Outside Diameter	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Inside Diameter	4	4	4	4	4	4	4	4	4	4
Casing Material	PVC40	SS304	PVC40	PVC40	SS304	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	36.2	19.0	15.5	21.9	11.0	8.8	22.9	25.8	53.3	11.3
Midpoint-Depth	43.1	26.4	19.3	26.0	14.8	12.5	28.0	30.4	59.4	14.9
Pump Intake-Depth	41.60	33.00	20.67	28.10	989.96	992.66	971.02	30.80	62.60	14.10
Bottom of Screen-Depth	46.7	33.7	23.1	29.4	18.4	16.2	33.1	33.9	65.2	18.3
Bottom-Depth	50.0	33.7	23.1	30.0	18.5	16.2	33.1	35.0	65.5	18.5
Top-Elevation	965.40	940.21	1,015.35	1,003.48	995.35	997.82	978.44	967.14	939.78	987.40
Midpoint-Elevation	958.50	932.86	1,011.55	999.43	991.60	994.12	973.34	962.54	933.68	983.80
Pump Intake-Elevation	960.04	926.18	1010.18	997.31	16.39	13.96	30.32	962.10	930.53	984.57
Bottom-Elevation	951.60	925.51	1,007.75	995.38	987.85	990.42	968.24	957.94	927.58	980.20
Screen Length	9.7	10.7	5.6	5.7	5.4	5.3	5.3	5.4	10.4	5.3
Screen Material	PVC/sl	SS/sw	PVC/sl	PVC/sl	SLS/SW	SLS/SW	SLS/SW	SS/sw	SS/sw	SS/sw
Slot Size	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	**GW-277**	**GW-281**	**GW-289**	**GW-292**	**GW-293**	**GW-294**	**GW-296**	**GW-298**	**GW-301**	**GW-305**
Hydrogeologic Regime	**BC**	**EF**	**BC**	**CR**	**CR**	**CR**	**CR**	**CR**	**CR**	**CR**
Functional Area	**S3**	**FF**	**BG**	**ECRWP**	**ECRWP**	**ECRWP**	**ECRWP**	**ECRWP**	**CRBAWP**	**LIV**
General Information										
Date Installed	07/15/86	08/20/86	11/20/86	05/22/87	06/11/87	05/01/87	05/11/87	07/27/87	07/02/87	08/25/87
Total Depth Drilled	77.4	17.5	40.8	186.0	214.0	128.0	147.0	190.0	182.0	179.6
East Coordinate	52,565	61,907	42,875	62,146	62,321	62,483	62,023	62,445	61,964	52,962
North Coordinate	29,937	29,771	29,982	28,141	28,112	27,958	27,994	27,495	27,662	28,548
Measuring Point	TOWW	TOC	TOWW	TOC	TOC	TOC	TOC	TOC	TOWW	TOWW
Measuring Point Elevation	1,001.76	946.10	948.73	1,073.00	1,063.90	1,083.60	1,090.99	1,049.01	1,086.55	1,183.72
Ground Surface Elevation	999.05	946.53	946.32	1,070.11	1,061.70	1,083.67	1,088.29	1,046.40	1,083.94	1,181.07
Tag Depth-(TOC)	80.63	14.85	43.14	187.59	216.40	130.76	148.16	189.36	165.23	181.06
Geologic Information										
Hydrostratigraphic Unit	AQT	AQT	AQT	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	Cn	Cn	Cm	OCk	OCk	OCk	OCk	OCk	OCk	OCk
Aquifer Zone	WT	WT	WT	BDR	BDR	BDR	BDR	BDR	BDR	BDR
Weathered Rock-Depth	17.5	17.5	24.0	32.0	57.0	62.0	67.0	65.0	94.0	53.0
Fresh Rock-Depth	65.0	.	38.0	59.5	110.0	87.0	81.5	80.0	136.0	84.0
Conductor Casing										
Casing Depth	17.3	.	.	51.0	57.8	74.5	86.5	83.3	105.0	64.0
Outside Diameter	10.63	.	.	10.75	10.75	10.75	10.75	10.75	10.75	10.75
Inside Diameter	10	.	.	10	10	10	10	10	10	10
Casing Material	PVC40	.	.	SF25	SF25	SF25	SF25	SF25	SF25	SF25
Well Casing										
Borehole Depth	77.4	17.5	40.8	186.0	197.0	128.0	147.0	190.0	163.5	179.6
Borehole Diameter	8	6	9	10	10	10	10	10	10	10
Casing Depth	67.0	5.0	30.6	174.1	197.0	117.6	136.3	176.0	151.0	168.9
Outside Diameter	4.5	4.5	4.5	4.5	6.62	4.5	4.5	4.5	4.5	4.5
Inside Diameter	4	4	4	4	.	4	4	4	4	4
Casing Material	SS304	SS304	SS304	SS304	SF25	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	62.2	4.0	28.9	172.1	197.0	113.0	134.4	171.1	148.5	165.3
Midpoint-Depth	69.8	9.5	34.9	179.1	205.5	120.5	140.7	180.6	156.0	172.5
Pump Intake-Depth	926.26	.	35.60	.	.	.	.	.	157.40	173.40
Bottom of Screen-Depth	77.4	15.0	40.6	184.8	.	128.0	146.8	186.0	161.0	179.6
Bottom-Depth	77.4	15.0	40.8	186.0	214.0	128.0	147.0	190.0	163.5	179.6
Top-Elevation	936.85	942.53	917.42	898.01	864.70	970.67	953.89	875.30	935.44	1,015.77
Midpoint-Elevation	929.25	937.03	911.47	891.06	856.20	963.17	947.59	865.85	927.94	1,008.62
Pump Intake-Elevation	72.79	.	910.73	.	.	.	.	.	926.55	1007.62
Bottom-Elevation	921.65	931.53	905.52	884.11	847.70	955.67	941.29	856.40	920.44	1,001.47
Screen Length	10.4	10	10	10.7	.	10.4	10.5	10	10	10.7
Screen Material	SLS/SW	SS/sl	SS/sw	SLS/SW	.	SLS/SW	SLS/SW	SLS/SW	SS/sw	SS/sw
Slot Size	0.01	0.01	0.01	0.01	.	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	17	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	6	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-307	GW-313	GW-315	GW-332	GW-336	GW-337	GW-363	GW-368	GW-369	GW-380
Hydrogeologic Regime	BC	BC	BC	EF	EF	EF	BC	BC	BC	EF
Functional Area	RS	SPI	SPI	WCPA	WCPA	WCPA	EMWMF	OLF	OLF	NHP
General Information										
Date Installed	07/15/87	09/11/87	09/25/87	08/11/87	08/06/87	08/12/87	03/16/88	06/13/88	05/31/88	08/19/88
Total Depth Drilled	41.6	113.0	104.0	24.1	21.4	22.1	75.0	245.0	150.2	15.5
East Coordinate	49,655	52,016	52,268	54,882	54,694	54,519	46,872	47,618	47,629	62,938
North Coordinate	29,346	29,351	29,455	30,058	30,057	30,057	29,961	28,913	28,921	28,714
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOC	TOWW
Measuring Point Elevation	993.14	1,059.74	1,047.45	981.24	985.92	987.48	957.91	1,000.53	999.72	913.55
Ground Surface Elevation	991.01	1,056.60	1,044.84	979.55	981.56	984.12	955.41	998.63	997.86	913.66
Tag Depth-(TOC)	43.60	121.40	105.98	27.07	23.93	25.33	77.27	247.46	150.30	15.80
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQT	AQT	AQT	AQT	AQF	AQF	AQF
Geologic Formation	Cmn	Cmn	Cmn	Cn	Cn	Cn	Cn	Cmn	Cmn	Cmn
Aquifer Zone	WT	BDR	BDR	WT	WT	WT	BDR	BDR	BDR	WT
Weathered Rock-Depth	41.6	30.0	54.0	6.0	4.0	.	9.0	18.0	10.8	15.5
Fresh Rock-Depth	.	34.5	71.0	.	.	.	21.0	32.0	68.0	.
Conductor Casing										
Casing Depth	.	42.5	84.4	.	.	.	36.0	30.0	31.0	.
Outside Diameter	.	10.75	10.75	.	.	.	10.75	11.75	11.75	.
Inside Diameter	.	10	10	.	.	.	10	11	11	.
Casing Material	NONE	SF25	SF25	.	.	.	STL	STL	STL	.
Well Casing										
Borehole Depth	41.6	113.0	104.0	24.1	21.4	22.1	50.0	225.0	115.8	15.5
Borehole Diameter	10	10	10	10	10	10	9.5	10.6	10.6	10
Casing Depth	30.9	101.4	93.3	18.7	15.8	16.7	48.3	223.7	115.8	4.8
Outside Diameter	4.5	4.5	4.5	4.5	4.5	4.5	6.62	6.62	6.62	4.5
Inside Diameter	4	4	4	4	4	4	.	.	.	.
Casing Material	SS304	SS304	SS304	SS304	SS304	SS304	SF25	SF25	SF25	SS304
Monitored Interval										
Top-Depth	28.7	98.2	90.0	16.8	13.2	15.0	50.0	225.0	115.8	2.8
Midpoint-Depth	35.2	105.6	97.0	20.5	17.3	18.6	62.5	235.0	133.0	9.2
Pump Intake-Depth	954.64	943.24	97.40	21.30	17.10	16.60	62.50	763.03	.	12.60
Bottom of Screen-Depth	41.6	112.1	103.3	24.1	21.4	22.1	.	.	.	15.2
Bottom-Depth	41.6	113.0	104.0	24.1	21.4	22.1	75.0	245.0	150.2	15.5
Top-Elevation	962.31	958.40	954.84	962.75	968.36	969.12	905.41	773.63	882.06	910.86
Midpoint-Elevation	955.86	951.00	947.84	959.10	964.26	965.57	892.91	763.63	864.86	904.51
Pump Intake-Elevation	36.37	113.36	947.45	958.24	964.42	967.48	892.91	235.60	.	901.05
Bottom-Elevation	949.41	943.60	940.84	955.45	960.16	962.02	880.41	753.63	847.66	898.16
Screen Length	10.7	10.7	10	5.4	5.6	5.4	.	.	.	10.4
Screen Material	SLS/SW	SLS/SW	SS/sw	SS/sw	SS/sw	SS/sw	.	.	.	SS/sw
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	.	.	.	0.01
Open-Hole Length	.	.	.	.	.	.	25	20	34.4	.
Open-Hole Diameter	.	.	.	.	.	.	6	6.1	6.1	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-381	GW-382	GW-383	GW-505	GW-521	GW-522	GW-537	GW-540	GW-542	GW-543
Hydrogeologic Regime	EF	EF	EF	EF	CR	CR	BC	CR	CR	CR
Functional Area	NHP	NHP	NHP	RG	LIV	LIV	OLF	LII	CDLVI	CDLVI
General Information										
Date Installed	04/25/88	04/11/88	04/04/88	04/06/88	09/14/88	09/20/88	09/14/88	06/02/89	05/18/89	06/02/89
Total Depth Drilled	60.4	173.0	24.1	13.5	136.0	195.5	24.5	171.5	77.5	94.0
East Coordinate	62,948	62,956	63,522	53,037	52,040	52,612	49,539	52,371	51,642	51,458
North Coordinate	28,715	28,716	29,201	30,400	28,541	28,377	30,057	27,489	27,466	27,072
Measuring Point	TOWW	TOC	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	913.36	913.17	908.77	1,015.19	1,182.88	1,175.48	976.65	1,072.31	1,051.81	1,024.01
Ground Surface Elevation	913.44	913.16	906.00	1,011.60	1,179.46	1,172.04	974.49	1,069.38	1,049.03	1,021.19
Tag Depth-(TOC)	61.01	173.20	26.54	16.80	136.70	197.10	27.35	173.83	79.09	96.24
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQT	AQT	AQF	AQF	AQT	AQF	AQF	AQF
Geologic Formation	Cmn	Cmn	Cn	Cn	OCk	OCk	Cn	OCk	OCk	OCk
Aquifer Zone	BDR	BDR	WT	WT	BDR	BDR	WT	BDR	WT	BDR
Weathered Rock-Depth	13.5	12.7	11.5	.	.	85.0	14.9	110.0	.	16.0
Fresh Rock-Depth	26.0	17.0	.	.	54.0	130.0	.	150.0	.	37.0
Conductor Casing										
Casing Depth	13.5	12.7	5.0	.	60.5	90.0	.	154.0	.	29.3
Outside Diameter	13	10.75	10.75	.	10.75	10.75	.	10.75	.	10.75
Inside Diameter	.	10	10	.	10	10	.	10	.	10
Casing Material	STL	STL	STL	NONE	STL	STL	.	STL	.	STL
Well Casing										
Borehole Depth	49.3	125.0	24.1	13.5	136.0	195.5	24.5	171.5	76.5	93.6
Borehole Diameter	9.5	9.5	8.75	7	9.5	9.5	8.75	9.25	9.25	9.25
Casing Depth	47.8	123.2	18.1	1.9	124.9	184.6	8.0	161.2	60.8	78.0
Outside Diameter	6.62	6.62	4.5	2.37	4.5	4.5	4.5	4.5	4.5	4.5
Inside Diameter	.	.	4	2	4	4	4	4	4	4
Casing Material	SF25	SF25	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	49.3	125.0	16.6	1.5	123.2	183.0	4.8	158.5	59.0	76.2
Midpoint-Depth	54.9	149.0	20.1	7.5	129.6	189.2	14.1	165.0	67.8	84.9
Pump Intake-Depth	55.50	.	20.50	997.69	129.00	187.60	22.80	166.10	68.70	85.60
Bottom of Screen-Depth	.	.	23.1	12.3	135.2	195.0	23.0	171.5	76.5	93.6
Bottom-Depth	60.4	173.0	23.6	13.5	136.0	195.3	23.3	171.5	76.5	93.6
Top-Elevation	864.14	788.16	889.40	1,010.10	1,056.26	989.04	969.69	910.88	990.03	944.99
Midpoint-Elevation	858.59	764.16	885.90	1,004.10	1,049.86	982.89	960.44	904.38	981.28	936.29
Pump Intake-Elevation	857.96	.	885.47	13.91	1050.48	984.48	951.65	903.31	980.31	935.61
Bottom-Elevation	853.04	740.16	882.40	998.10	1,043.46	976.74	951.19	897.88	972.53	927.59
Screen Length	.	.	5	10.4	10.3	10.4	15	10.3	15.7	15.6
Screen Material	.	.	SS/sw	SLS/SW	SS/sw	SS/sw	SS/sw	SS/sl	SS/sl	SS/sl
Slot Size	.	.	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	11.1	48	.	.	.	.	.	.	.	.
Open-Hole Diameter	6.1	6.13	.	.	.	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-544	GW-557	GW-560	GW-562	GW-564	GW-601	GW-605	GW-606	GW-612	GW-615
Hydrogeologic Regime	CR	CR	CR	CR	CR	BC	EF	EF	CR	BC
Functional Area	CDLVI	LV	CDLVII	CDLVII	CDLVII	OLF	EXP-I	EXP-I	CRSP	S3
General Information										
Date Installed	05/30/89	12/02/88	12/30/88	01/13/89	01/27/89	08/31/89	03/19/91	03/20/91	11/01/89	02/13/90
Total Depth Drilled	110.0	139.0	117.0	133.0	88.0	356.0	40.5	175.0	254.0	245.0
East Coordinate	51,820	59,520	60,743	61,640	59,865	47,629	62,002	61,951	58,504	52,224
North Coordinate	26,963	26,450	25,692	26,276	25,873	28,903	28,707	28,708	28,371	30,009
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	1,045.19	1,081.36	949.05	934.69	938.07	1,002.80	919.06	919.59	1,131.03	1,017.55
Ground Surface Elevation	1,042.53	1,078.63	945.76	931.86	935.12	999.09	916.97	916.98	1,128.65	1,014.17
Tag Depth-(TOC)	111.80	136.07	82.90	61.24	78.74	358.61	42.00	174.36	256.28	246.84
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQT
Geologic Formation	OCk	OCk	OCk	OCk	OCk	Cmn	Cmn	Cmn	OCk	Cn
Aquifer Zone	BDR	WT	WT	WT	WT	BDR	BDR	BDR	BDR	BDR
Weathered Rock-Depth	47.0	113.8	92.0	.	.	8.0	.	.	78.0	15.0
Fresh Rock-Depth	52.5	134.0	.	52.0	72.0	54.0	9.5	10.8	125.0	40.0
Conductor Casing										
Casing Depth	54.5	85.0	.	.	.	41.4	9.5	64.7	136.9	84.5
Outside Diameter	10.75	10.75	.	.	.	11.75	11.75	7	11.75	11.75
Inside Diameter	10	10	.	.	.	11	11	6.4	11	11
Casing Material	STL	STL	.	.	.	STL	SJ55	SJ55	SJ55	SJ55
Well Casing										
Borehole Depth	109.3	138.0	117.0	60.0	81.0	319.0	40.5	175.0	235.0	222.5
Borehole Diameter	9.25	9.5	9.5	9.5	9.5	10.63	10.6	9.63	10.63	10.63
Casing Depth	93.4	115.8	49.0	38.0	55.3	317.2	29.7	161.0	230.6	221.2
Outside Diameter	4.5	4.5	4.5	4.5	4.5	7	4.25	4.25	7	7
Inside Diameter	4	4	4	4	4	.	4	4	6.54	6.54
Casing Material	SS304	SS304	SS304	SS304	SS304	STL	SS304	SS304	SF25	SF25
Monitored Interval										
Top-Depth	91.0	112.9	45.2	36.0	52.0	318.5	28.2	155.0	230.6	222.5
Midpoint-Depth	100.2	125.5	57.1	48.0	66.5	337.3	34.1	163.0	242.3	233.8
Pump Intake-Depth	100.80	123.60	59.40	48.20	65.50	657.80	33.90	166.40	247.60	68.60
Bottom of Screen-Depth	109.3	135.8	69.0	58.0	75.3	.	39.7	171.0	.	.
Bottom-Depth	109.3	138.0	69.0	60.0	81.0	356.0	39.9	171.0	254.0	245.0
Top-Elevation	951.53	965.73	900.56	895.86	883.12	680.59	888.77	761.98	898.05	791.67
Midpoint-Elevation	942.38	953.18	888.66	883.86	868.62	661.84	882.92	753.98	886.35	780.42
Pump Intake-Elevation	941.69	955.06	886.35	883.69	869.57	341.29	883.06	750.59	881.03	945.55
Bottom-Elevation	933.23	940.63	876.76	871.86	854.12	643.09	877.07	745.98	874.65	769.17
Screen Length	15.9	20	20	20	20	.	10	10	.	.
Screen Material	SS/sl	SS/sw	SS/sw	SS/sw	SS/sw	.	SS/sw	SS/ppk	.	.
Slot Size	0.01	0.01	0.01	0.01	0.01	.	0.01	0.01	.	.
Open-Hole Length	.	.	.	.	.	37.5	.	.	23.4	22.5
Open-Hole Diameter	.	.	.	.	.	6.25	.	.	6.25	6.25

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-616	GW-618	GW-620	GW-626	GW-627	GW-629	GW-639	GW-653	GW-656	GW-658
Hydrogeologic Regime	BC	EF	EF	BC	BC	BC	BC	BC	EF	EF
Functional Area	S3	EXP-E	FTF	BG	BG	BG	EMWMF	BG	T0134	FF
General Information										
Date Installed	03/10/90	03/15/90	03/27/90	12/15/89	12/11/89	02/02/90	06/15/90	08/10/90	07/19/90	08/31/90
Total Depth Drilled	269.0	37.0	75.0	78.0	270.0	312.0	125.5	39.0	21.5	19.1
East Coordinate	51,907	54,738	52,895	42,772	42,774	43,047	45,260	42,317	57,439	62,146
North Coordinate	29,724	29,798	29,565	29,535	29,505	29,522	29,626	29,660	29,895	29,638
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	1,011.81	985.14	1,015.57	942.87	943.51	928.03	940.95	931.84	954.79	944.81
Ground Surface Elevation	1,009.81	982.64	1,012.84	939.95	940.39	924.42	937.98	928.85	954.90	942.04
Tag Depth-(TOC)	270.59	38.30	77.91	80.92	270.96	314.59	129.64	41.53	20.60	20.64
Geologic Information										
Hydrostratigraphic Unit	AQT	AQF	AQF	AQT	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	Cn	Cmn	Cmn	Cn	Cn	Cn	Cn	Cn	Cn	Cn
Aquifer Zone	BDR	WT	WT	BDR	BDR	BDR	BDR	WT	WT	WT
Weathered Rock-Depth	35.0	25.0	41.0	2.0	3.0	12.0	3.0	3.5	12.0	1.5
Fresh Rock-Depth	42.0	27.0	70.0	64.0	43.0	42.0	20.0	35.0	.	.
Conductor Casing										
Casing Depth	45.6	27.5	42.5	62.5	47.5	45.1	31.0	.	.	3.5
Outside Diameter	11.75	10.75	10.75	11.75	11.75	11.75	11.75	.	.	10.75
Inside Diameter	11	10	10	11	11	11	11	.	.	10
Casing Material	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	.	.	SJ55
Well Casing										
Borehole Depth	219.7	37.0	75.0	78.0	254.0	262.3	95.5	39.0	21.5	19.1
Borehole Diameter	10.63	9.5	9.5	9.5	10.63	10.63	10	9.5	9.5	9.5
Casing Depth	217.8	26.7	64.2	67.7	252.7	266.3	94.5	29.0	10.7	8.8
Outside Diameter	7	4.5	4.5	4.5	7	7	7	4.5	4.5	4.5
Inside Diameter	6.54	4.25	4.25	4.25	6.54	6.54	6.54	4.25	4.25	4.25
Casing Material	SF25	SS304	SS304	SS304	SF25	SF25	SF25	SS304	SS304	SS304
Monitored Interval										
Top-Depth	219.1	26.0	61.7	63.0	254.0	262.3	95.5	26.3	8.3	6.9
Midpoint-Depth	244.1	31.5	68.4	70.5	262.0	287.2	110.5	32.7	14.9	13.0
Pump Intake-Depth	263.00	32.50	70.30	73.30	255.90	286.40	.	33.50	18.10	13.80
Bottom of Screen-Depth	.	37.0	75.0	77.7	.	.	.	39.0	20.7	18.8
Bottom-Depth	269.0	37.0	75.0	78.0	270.0	312.0	125.5	39.0	21.5	19.1
Top-Elevation	790.71	956.64	951.14	876.95	686.39	662.12	842.48	902.55	946.60	935.14
Midpoint-Elevation	765.76	951.14	944.49	869.45	678.39	637.27	827.48	896.20	940.00	929.04
Pump Intake-Elevation	746.81	950.14	942.57	866.67	684.51	638.03	.	895.34	936.79	928.21
Bottom-Elevation	740.81	945.64	937.84	861.95	670.39	612.42	812.48	889.85	933.40	922.94
Screen Length	.	10.3	10.8	10	.	.	.	10	10	10
Screen Material	.	SS/sw	SS/sw	SS/sw	.	.	.	SS/sw	SS/sw	SS/sw
Slot Size	.	0.01	0.01	0.01	.	.	.	0.01	0.01	0.01
Open-Hole Length	49.9	.	.	.	16	49.7	30	.	.	.
Open-Hole Diameter	6.25	.	.	.	6.25	6.5	6.25	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-683	GW-684	GW-686	GW-690	GW-691	GW-692	GW-694	GW-698	GW-700	GW-703
Hydrogeologic Regime	BC	BC	EF	EF	EF	EF	BC	EF	EF	BC
Functional Area	EXP-A	EXP-A	CPT	CPT	CPT	CPT	EXP-B	B8110	B8110	EXP-B
General Information										
Date Installed	12/03/90	10/09/90	10/18/90	10/24/90	10/24/90	10/25/90	02/07/91	11/02/90	10/03/90	12/07/90
Total Depth Drilled	197.5	129.6	17.0	53.0	20.0	53.0	204.5	75.0	31.0	182.0
East Coordinate	41,552	41,354	55,956	55,990	55,983	56,001	44,893	56,804	56,828	44,931
North Coordinate	28,282	28,525	29,540	29,787	29,794	29,653	28,845	29,277	29,453	28,806
Measuring Point	TOWW	TOWW	TOC	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	972.23	898.83	963.76	967.36	968.59	964.38	941.98	970.09	960.18	955.29
Ground Surface Elevation	969.45	895.53	964.43	967.71	968.09	964.55	938.58	970.09	957.78	951.80
Tag Depth-(TOC)	199.83	132.21	16.23	53.25	20.39	53.05	207.27	74.88	33.19	185.29
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	OCk	Cmn	Cmn	Cmn	Cmn	Cmn	Cmn	Cmn	Cmn	Cmn
Aquifer Zone	BDR	BDR	WT	BDR	WT	BDR	BDR	BDR	WT	BDR
Weathered Rock-Depth	22.0	.	17.0	24.0	20.0	23.0	11.0	42.0	31.0	7.0
Fresh Rock-Depth	26.0	9.5	.	.	.	.	21.0	.	.	10.0
Conductor Casing										
Casing Depth	82.0	87.0	.	26.0	.	25.0	25.8	42.0	.	.
Outside Diameter	11.75	11.75	.	10.5	.	10.5	11.75	10.5	.	.
Inside Diameter	11	11	.	10	.	10	11	10	.	.
Casing Material	SJ55	SJ55	.	PVC40	.	PVC40	STL	PVC40	.	.
Well Casing										
Borehole Depth	197.5	129.6	16.0	53.0	20.0	53.0	154.0	75.0	31.0	135.0
Borehole Diameter	10.63	10.5	12	8.5	12	8.5	10.6	8.5	12	10.63
Casing Depth	146.0	113.8	6.0	42.8	10.0	43.0	152.0	65.0	21.0	132.8
Outside Diameter	4.5	4.5	4.5	4.5	4.5	4.5	7	4.5	4.5	7
Inside Diameter	4.25	4.25	4.25	4.25	4.25	4.25	6.45	4.25	4.25	6.54
Casing Material	SS304	SS304	SS304	SS304	SS304	SS304	SF25	SS304	SS304	SF25
Monitored Interval										
Top-Depth	133.9	106.4	4.0	40.8	8.0	41.0	153.0	63.0	19.0	133.8
Midpoint-Depth	165.4	118.0	10.0	46.8	14.0	47.0	178.8	69.0	25.0	157.9
Pump Intake-Depth	171.20	119.70	15.67	48.40	14.50	48.20	178.70	71.00	26.10	158.50
Bottom of Screen-Depth	196.8	128.4	16.0	52.8	20.0	53.0	.	75.0	31.0	.
Bottom-Depth	196.8	129.6	16.0	52.8	20.0	53.0	204.5	75.0	31.0	182.0
Top-Elevation	835.55	789.13	960.43	926.91	960.09	923.55	785.58	907.09	938.78	818.00
Midpoint-Elevation	804.10	777.53	954.43	920.91	954.09	917.55	759.83	901.09	932.78	793.90
Pump Intake-Elevation	798.23	775.83	948.76	919.36	953.59	916.38	759.88	899.09	931.68	793.29
Bottom-Elevation	772.65	765.93	948.43	914.91	948.09	911.55	734.08	895.09	926.78	769.80
Screen Length	50.8	14.6	10	10	10	10	.	10	10	.
Screen Material	SS/ppck	SS/ppck	SS/sw	SS/sw	SS/sw	SS/sw	.	SS/sw	SS/sw	.
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	.	0.01	0.01	.
Open-Hole Length	.	.	.	.	.	.	51.5	.	.	48.2
Open-Hole Diameter	.	.	.	.	.	.	6.25	.	.	6.25

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-704	GW-706	GW-709	GW-712	GW-713	GW-714	GW-722	GW-724	GW-725	GW-731
Hydrogeologic Regime	BC	BC	CR	BC	BC	BC	EF	BC	BC	CR
Functional Area	EXP-B	EXP-B	LII	EXP-W	EXP-W	EXP-W	EXP-J	EXP-C	EXP-C	CRSDB
General Information										
Date Installed	12/20/90	01/27/91	04/05/91	06/20/91	01/13/92	01/24/92	08/09/91	08/12/91	08/27/91	09/12/91
Total Depth Drilled	256.0	182.5	80.6	457.5	315.2	145.0	644.3	301.6	142.5	180.4
East Coordinate	44,935	44,944	52,372	36,507	36,434	36,435	64,926	48,995	48,989	63,863
North Coordinate	28,845	28,946	25,344	28,233	28,236	28,422	28,532	29,198	29,405	27,464
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOC	TOWW	TOWW	TOWW
Measuring Point Elevation	945.33	929.47	906.81	877.89	881.43	875.88	953.71	979.75	961.63	1,049.38
Ground Surface Elevation	941.99	925.78	903.84	873.61	877.83	872.30	951.04	976.62	958.26	1,045.75
Tag Depth-(TOC)	258.65	185.79	83.52	460.53	318.39	146.90	642.68	293.60	145.42	178.53
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	Cmn	Cmn	OCk	OCk	Cmn	Cmn	Cmn	Cmn	Cmn	OCk
Aquifer Zone	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR
Weathered Rock-Depth	16.0	17.0	39.0	12.0	26.8	27.0	54.0	33.5	14.0	95.4
Fresh Rock-Depth	23.0	27.0	43.0	66.0	63.8	35.0	73.0	40.0	17.5	129.4
Conductor Casing										
Casing Depth	21.0	40.3	50.0	44.8	80.2	40.5	56.2	40.0	21.0	122.0
Outside Diameter	11.75	11.75	11.75	11.75	.	11.75	10.75	11.75	11.75	11.75
Inside Diameter	11	11	11	11	.	11	10	11	11	11
Casing Material	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55
Well Casing										
Borehole Depth	246.0	157.0	80.6	441.5	305.0	115.1	75.0	289.6	132.5	175.4
Borehole Diameter	10.63	10.6	10.6	10.6	10.6	10.6	6	10.6	10.6	10.6
Casing Depth	243.5	155.1	70.4	440.2	303.7	113.8	74.5	288.3	131.2	165.2
Outside Diameter	7	7	4.25	7	7	7	4.5	7	7	4.5
Inside Diameter	6.54	6.54	4	6.54	6.54	6.54	4	6.54	6.54	4.25
Casing Material	SF25	SF25	SS304	SF25	SF25	SF25	SJ55	SF25	SF25	SS304
Monitored Interval										
Top-Depth	244.5	156.1	68.7	441.5	305.0	115.1	74.5	289.6	132.5	164.0
Midpoint-Depth	250.3	169.3	74.7	449.5	310.1	130.1	359.4	295.6	137.5	171.4
Pump Intake-Depth	250.20	174.80	75.50	446.20	307.40	138.40	.	294.40	137.10	169.90
Bottom of Screen-Depth	.	.	80.4	.	.	.	.	.	.	175.2
Bottom-Depth	256.0	182.5	80.6	457.5	315.2	145.0	644.3	301.6	142.5	178.7
Top-Elevation	697.49	769.68	835.14	432.11	572.83	757.20	876.54	687.02	825.76	881.75
Midpoint-Elevation	691.74	756.48	829.19	424.11	567.73	742.25	591.64	681.02	820.76	874.40
Pump Intake-Elevation	691.83	750.97	828.31	427.39	570.43	733.88	.	682.25	821.13	875.88
Bottom-Elevation	685.99	743.28	823.24	416.11	562.63	727.30	306.74	675.02	815.76	867.05
Screen Length	.	.	10	.	.	.	.	.	.	10
Screen Material	.	.	SS/sw	.	.	.	.	.	.	SS/sw
Slot Size	.	.	0.01	.	.	.	.	.	.	0.01
Open-Hole Length	11.5	26.4	.	16	10.2	29.9	569.8	12	10	.
Open-Hole Diameter	6.5	6.25	.	6.25	6.25	6.25	3.5	6.25	6.25	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number Hydrogeologic Regime Functional Area	GW-732 CR CRSDB	GW-733 EF EXP-J	GW-735 EF EXP-J	GW-738 BC EXP-C	GW-740 BC EXP-C	GW-744 EF GRIDK1	GW-747 EF GRIDK2	GW-750 EF EXP-J	GW-757 CR LII	GW-762 EF GRIDJ3
General Information										
Date Installed	09/11/91	10/02/91	10/30/91	11/21/91	12/20/91	01/08/92	01/28/92	02/06/92	04/24/92	05/15/92
Total Depth Drilled	190.6	256.5	83.0	90.1	190.0	69.5	73.3	72.8	166.5	60.2
East Coordinate	64,268	65,067	64,872	49,026	49,055	64,324	64,570	64,835	53,303	63,193
North Coordinate	27,717	28,447	28,867	29,150	29,027	30,282	29,730	28,975	25,410	29,115
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOC	TOWW	TOWW	TOWW
Measuring Point Elevation	1,064.29	959.84	924.46	983.31	1,020.25	907.43	911.06	919.03	961.64	915.56
Ground Surface Elevation	1,060.65	955.69	921.34	980.36	1,016.95	905.05	911.68	915.96	958.65	911.85
Tag Depth-(TOC)	192.84	259.93	81.81	91.78	192.67	69.28	75.7	75.49	168.54	62.04
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQT	AQF	AQF	AQT	AQT	AQT	AQF	AQT
Geologic Formation	OCk	Cmn	Cn	Cmn	Cmn	Cpv	Cm	Cn	OCk	Cn
Aquifer Zone	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR
Weathered Rock-Depth	85.0	42.5	19.0	12.0	38.1	9.6	3.9	18.5	29.5	12.0
Fresh Rock-Depth	96.0	47.1	77.5	15.1	45.1	14.6	5.4	24.8	48.0	14.5
Conductor Casing										
Casing Depth	100.7	51.8	25.5	16.5	46.9	27.6	17.2	21.7	46.8	19.4
Outside Diameter	11.75	11.75	11.75	11.75	11.75	10.75	10.75	11.75	10.75	11.75
Inside Diameter	11	11	11	11	11	10	10	11	10.25	11
Casing Material	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55
Well Casing										
Borehole Depth	189.5	240.1	83.0	90.1	165.6	69.5	73.3	72.8	166.5	60.2
Borehole Diameter	10.6	10.6	10.6	10.6	10.6	9.87	9.87	10.6	9.62	9.87
Casing Depth	179.3	238.8	67.9	67.3	164.3	57.0	62.6	62.4	135.5	48.2
Outside Diameter	4.5	7	4.5	4.5	7	4.5	4.5	4.5	4.5	4.5
Inside Diameter	4.25	6.54	4.25	4.25	6.54	4.25	4.25	4.25	4.25	4.25
Casing Material	SS304	SF25	SS304	SS304	SF25	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	178.3	240.1	67.5	63.5	165.6	55.0	60.8	61.2	134.0	46.4
Midpoint-Depth	184.2	248.3	73.4	75.8	177.8	62.3	66.9	67.0	150.3	52.6
Pump Intake-Depth	184.40	248.90	847.76	78.60	183.70	65.10	62.0	848.33	155.00	.
Bottom of Screen-Depth	189.3	.	77.9	87.3	.	66.9	72.5	72.3	165.5	58.1
Bottom-Depth	190.0	256.5	79.2	88.0	190.0	69.5	73.0	72.7	166.5	58.7
Top-Elevation	882.35	715.59	853.84	916.86	851.35	850.05	844.28	854.76	824.65	865.45
Midpoint-Elevation	876.50	707.39	847.99	904.61	839.15	842.80	838.18	849.01	808.40	859.30
Pump Intake-Elevation	876.29	706.84	73.58	901.81	833.25	839.93	843.06	67.63	803.64	.
Bottom-Elevation	870.65	699.19	842.14	892.36	826.95	835.55	832.08	843.26	792.15	853.15
Screen Length	10	.	10	20	.	9.9	9.9	9.9	30	9.9
Screen Material	SS/sw	.	SLS/SW	SS/sw	.	SS/sw	SS/sw	SLS/SW	SS/sw	SS/sw
Slot Size	0.01	.	0.01	0.01	.	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	16.4	.	.	24.4	.	.	.	.	.
Open-Hole Diameter	.	6.25	.	.	6.25	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number	GW-763	GW-765	GW-769	GW-770	GW-775	GW-776	GW-779	GW-781	GW-782	GW-783
Hydrogeologic Regime	EF	EF	EF	EF	EF	EF	EF	EF	EF	EF
Functional Area	GRIDJ3	GRIDE1	GRIDG3	GRIDG3	GRIDH3	GRIDH3	GRIDF2	GRIDE3	GRIDE3	GRIDE3
General Information										
Date Installed	05/13/92	05/13/92	06/04/92	06/04/92	07/16/92	07/21/92	08/02/92	08/10/92	08/12/92	08/13/92
Total Depth Drilled	17.0	32.5	61.4	20.0	60.5	24.0	63.1	69.6	36.0	16.3
East Coordinate	63,220	58,482	60,230	60,255	61,278	61,309	59,247	58,118	58,099	58,113
North Coordinate	29,117	31,026	29,510	29,505	29,272	29,271	30,226	29,711	29,719	29,734
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOC	TOWW	TOWW	TOWW
Measuring Point Elevation	915.03	1,008.54	944.43	944.72	931.35	931.25	963.09	947.89	947.73	948.49
Ground Surface Elevation	911.38	1,005.53	941.53	941.67	931.48	931.44	959.73	944.66	944.48	945.81
Tag Depth-(TOC)	20.41	35.05	62.73	21.68	55.98	21.92	65.35	71.07	38.23	17.98
Geologic Information										
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	Cn	Crg	Cn	Cn	Cn	Cn	Cm	Cn	Cn	Cn
Aquifer Zone	WT	WT	BDR	WT	BDR	WT	BDR	BDR	BDR	WT
Weathered Rock-Depth	17.0	24.5	14.2	12.0	.	14.5	7.2	0.9	1.0	1.0
Fresh Rock-Depth	.	.	.	16.5	16.7	19.3	18.2	14.0	7.5	8.5
Conductor Casing										
Casing Depth	.	.	17.2	.	16.7	.	23.3	23.8	.	.
Outside Diameter	.	.	11.75	.	11.75	.	10.75	10.75	.	.
Inside Diameter	.	.	11	.	11	.	10	10	.	.
Casing Material	.	NONE	SJ55	.	SJ55	NONE	SJ55	SJ55	.	.
Well Casing										
Borehole Depth	17.0	32.5	61.4	20.0	60.5	24.0	63.1	69.6	36.0	16.3
Borehole Diameter	8	9.87	10.62	10.62	10.62	9.87	9.87	9.87	9.87	9.87
Casing Depth	5.2	21.2	49.4	8.5	46.3	12.3	52.1	57.8	25.0	4.2
Outside Diameter	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Inside Diameter	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
Casing Material	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	4.0	19.9	48.2	7.5	45.0	10.6	50.7	56.0	23.8	3.6
Midpoint-Depth	10.0	26.2	54.3	13.3	50.7	16.8	56.8	62.7	29.9	10.0
Pump Intake-Depth	11.80	978.54	54.90	13.60	880.35	914.25	.	62.80	29.80	10.30
Bottom of Screen-Depth	15.2	31.5	59.3	18.4	56.2	22.2	62.0	68.0	34.9	13.9
Bottom-Depth	16.0	32.4	60.3	19.0	56.4	23.0	62.9	69.3	35.9	16.3
Top-Elevation	907.38	985.63	893.33	934.17	886.48	920.84	909.03	888.66	920.68	942.21
Midpoint-Elevation	901.38	979.38	887.28	928.42	880.78	914.64	902.93	882.01	914.63	935.86
Pump Intake-Elevation	899.63	26.99	886.63	928.02	51.13	17.19	.	881.89	914.73	935.49
Bottom-Elevation	895.38	973.13	881.23	922.67	875.08	908.44	896.83	875.36	908.58	929.51
Screen Length	10	10.3	9.9	9.9	9.9	9.9	9.9	10.2	9.9	9.7
Screen Material	SS/sw	SLS/SW	SS/sw	SS/sw	SLS/SW	SLS/SW	SLS/SW	SS/sw	SS/sw	SS/sw
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number Hydrogeologic Regime Functional Area	GW-791 EF GRIDD2	GW-792 EF GRIDD2	GW-796 CR LV	GW-797 CR LV	GW-798 CR CDLVII	GW-799 CR LV	GW-801 CR LV	GW-802 EF FF	GW-816 EF EXP-SR	GW-820 EF B9201-2
General Information										
Date Installed	09/21/92	09/24/92	03/04/93	03/16/93	03/18/93	03/25/93	07/01/93	06/25/93	06/02/94	.
Total Depth Drilled	70.6	29.2	139.7	134.1	135.5	92.0	188.9	26.5	16.1	17.3
East Coordinate	57,423	57,442	58,206	58,550	60,310	59,961	58,780	62,217	64,031	59,773
North Coordinate	30,483	30,481	27,924	27,447	27,265	26,746	26,808	29,655	31,582	29,175
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOC	TOWW	TOWW
Measuring Point Elevation	992.13	992.74	1,052.62	1,060.00	1,006.00	981.29	1,097.16	941.83	898.42	929.57
Ground Surface Elevation	988.51	989.60	1,048.80	1,056.10	1,002.42	978.10	1,093.82	942.30	894.56	929.67
Tag Depth-(TOC)	72.45	31.99	139.82	135.71	134.00	97.58	190.92	25.42	17.99	17.18
Geologic Information										
Hydrostratigraphic Unit	AQT	AQT	AQF	AQF	AQF	AQF	AQF	AQT	AQT	AQF
Geologic Formation	Cm	Cm	OCk	OCk	OCk	OCk	OCk	Cn	Cr	Cmn
Aquifer Zone	BDR	WT	BDR	BDR	BDR	BDR	BDR	WT	WT	WT
Weathered Rock-Depth	14.7	14.5	102.0	67.1	94.4	60.8	112.5	10.0	.	.
Fresh Rock-Depth	26.0	.	103.0	89.0	95.8	62.8	113.4	15.0	.	.
Conductor Casing										
Casing Depth	31.5	.	107.6	95.0	99.7	65.0	115.4	.	.	.
Outside Diameter	10.75	.	10.75	10.75	10.75	10.75	10.75	.	.	.
Inside Diameter	10	.	10	10	10	10	10	.	.	.
Casing Material	SJ55	.	SJ55	SJ55	SJ55	SJ55	SJ55	.	.	.
Well Casing										
Borehole Depth	70.6	29.2	139.7	134.1	135.5	92.0	188.9	26.5	15.8	.
Borehole Diameter	9.87	9.87	9.5	9.5	9.5	9.5	9.87	10.62	10	.
Casing Depth	59.0	18.5	126.5	123.5	124.5	81.0	178.1	15.5	4.2	.
Outside Diameter	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Inside Diameter	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4	4.25	4
Casing Material	SS304	SS304	SS304	SS304	SS304	SS304	SS304	PVC40	SS304	PVC
Monitored Interval										
Top-Depth	57.5	17.0	122.9	118.0	122.0	78.7	175.8	13.3	2.9	.
Midpoint-Depth	64.1	23.0	129.7	126.1	128.7	85.4	182.4	19.9	9.4	.
Pump Intake-Depth	63.80	24.90	131.20	128.10	125.90	84.80	177.70	.	11.10	15.60
Bottom of Screen-Depth	68.9	28.2	136.4	133.4	134.4	90.9	188.0	25.5	13.6	.
Bottom-Depth	70.6	29.0	136.5	134.1	135.4	92.0	188.9	26.5	15.8	17.3
Top-Elevation	931.01	972.60	925.90	938.10	880.42	899.40	918.02	929.00	891.66	.
Midpoint-Elevation	924.46	966.60	919.10	930.05	873.72	892.75	911.47	922.40	885.21	.
Pump Intake-Elevation	924.73	964.74	917.62	928.00	876.50	893.29	916.16	.	883.42	914.07
Bottom-Elevation	917.91	960.60	912.30	922.00	867.02	886.10	904.92	915.80	878.76	912.37
Screen Length	9.9	9.7	9.9	9.9	9.9	9.9	9.9	10	9.4	.
Screen Material	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	PVC/sl	SS/sw	.
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	.
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, CY 2007

Well Number Hydrogeologic Regime Functional Area	GW-827 CR CDLVI	GW-831 CR FCAP	GW-832 EF NHP	GW-916 BC EMWMF	GW-917 BC EMWMF	GW-918 BC EMWMF	GW-920 BC EMWMF	GW-921 BC EMWMF	GW-922 BC EMWMF	GW-923 BC EMWMF
General Information										
Date Installed	01/24/95	07/30/96	05/09/96	01/29/01	01/22/01	02/02/01	01/16/01	01/31/01	01/17/01	02/01/01
Total Depth Drilled	135.0	200.0	11.9	36.0	51.0	75.0	55.0	50.0	46.0	102.0
East Coordinate	51,826	56,593	64,134	48,276	47,914	47,549	47,375	47,139	47,147	48,184
North Coordinate	27,721	26,654	29,142	31,186	30,463	31,672	30,193	30,350	30,024	30,822
Measuring Point	TOWW	TOWW	TOC	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW	TOWW
Measuring Point Elevation	1,051.60	1,091.29	906.18	1,002.85	997.10	1,067.96	967.43	971.29	956.91	1,016.73
Ground Surface Elevation	1,048.13	1,088.04	906.83	.	.	.	.	.	.	.
Tag Depth-(TOC)	137.22	198.06	10.36	.	.	.	.	.	.	.
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQT	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	OCk	OCk	Cmn	Cc	Cc	Cc	Cc	Cc	Cc	Cc
Aquifer Zone	BDR	BDR	WT	WT	WT	WT	BDR	BDR	BDR	WT
Weathered Rock-Depth	.	134.8	.	10.0	21.0	.	.	.	10.0	.
Fresh Rock-Depth	40.5	140.8	.	15.0	27.0	30.0	12.0	13.0	13.0	62.0
Conductor Casing										
Casing Depth	43.4	138.3	.	.	.	.	.	.	.	.
Outside Diameter	10.75	10.75	.	.	.	.	.	.	.	.
Inside Diameter	10	10	.	.	.	.	.	.	.	.
Casing Material	STL	STL	.	.	.	.	.	.	.	.
Well Casing										
Borehole Depth	135.0	200.0	11.9	.	.	.	.	.	.	.
Borehole Diameter	9.87	9.87	12	.	.	.	.	.	.	.
Casing Depth	124.1	183.2	5.9	.	20.0	20.0	24.0	18.0	25.0	40.0
Outside Diameter	4.5	4.5	6.63	.	2.37	.	2.37	2.37	2.37	2.37
Inside Diameter	4.25	4.25	6	.	2.07	.	2.07	2.07	2.07	2.07
Casing Material	SS304	SLS	PVC	.	SS304	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	122.1	182.0	4.0	13.0	18.0	18.0	22.0	16.0	23.0	36.0
Midpoint-Depth	128.5	190.8	7.9	24.5	34.5	25.5	38.5	33.0	34.5	55.5
Pump Intake-Depth	128.70	188.80	.	.	.	.	.	.	.	.
Bottom of Screen-Depth	134.1	193.6	10.9	35.0	50.0	30.0	54.0	48.0	45.0	70.0
Bottom-Depth	134.8	199.6	11.8	36.0	51.0	33.0	55.0	50.0	46.0	75.0
Top-Elevation	926.03	906.04	902.83	.	.	.	.	.	.	.
Midpoint-Elevation	919.68	897.24	898.93	.	.	.	.	.	.	.
Pump Intake-Elevation	919.40	899.29	.	975.35	959.60	1039.46	925.93	935.29	919.41	958.23
Bottom-Elevation	913.33	888.44	895.03	.	.	.	.	.	.	.
Screen Length	10	10.4	5	20	30	10	30	30	20	30
Screen Material	SS/sw	SS/sw	PVC/sl	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw
Slot Size	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.

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Well Number Hydrogeologic Regime Functional Area	GW-924 BC EMWMF	GW-925 BC EMWMF	GW-926 BC EMWMF	GW-927 BC EMWMF	GW-954 EF Y12	GW-956 EF Y12	GW-959 EF B9201-2	GW-960 EF GridF2
General Information								
Date Installed	01/29/01	02/05/01	02/01/01	02/01/01	08/09/05	08/10/05	03/11/05	07/28/06
Total Depth Drilled	54.0	170.0	145.0	172.0	170.0	170.0	9.0	25.4
East Coordinate	46,300	47,128	46,290	47,906	58,218	61,050	60,189	59,228
North Coordinate	30,185	30,349	30,185	30,463	30,622	29,475	29,115	30,212
Measuring Point	TOWW	TOWW	TOWW	TOWW	TOC	GS	TOWW	TOC
Measuring Point Elevation	968.90	971.14	968.94	997.19	988.27	940.00	927.69	963.26
Ground Surface Elevation	.	.	.	.	988.73	940.00	928.32	959.88
Tag Depth-(TOC)	.	.	.	.	.	.	.	.
Geologic Information								
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQT	AQT	AQF	AQT
Geologic Formation	Cc	Cc	Cc	Cc	Cc	Cc	Cmn	Cn
Aquifer Zone	WT	BDR	BDR	BDR	BDR	BDR	WT	WT
Weathered Rock-Depth	21.8	.	15.0	25.0	.	.	.	17.0
Fresh Rock-Depth	22.0	15.0	18.0	30.0	.	.	.	17.2
Conductor Casing								
Casing Depth	.	.	.	.	.	.	.	.
Outside Diameter	.	.	.	.	.	.	.	.
Inside Diameter	.	.	.	.	.	.	.	.
Casing Material	.	.	.	.	.	.	.	.
Well Casing								
Borehole Depth	.	.	.	.	.	.	9.0	25.4
Borehole Diameter	.	.	.	.	.	.	7.5	.
Casing Depth	23.0	97.0	113.0	60.0	.	.	3.4	14.6
Outside Diameter	2.37	2.37	2.37	2.37	.	.	4.5	4.5
Inside Diameter	2.07	2.07	2.07	2.07	.	.	4.25	4
Casing Material	SS304	SS304	SS304	SS304	.	.	SS304	PVC
Monitored Interval								
Top-Depth	21.0	92.0	103.0	57.0	25.3	18.0	2.4	12.2
Midpoint-Depth	37.5	120.0	124.0	74.5	.	.	5.4	18.8
Pump Intake-Depth	.	.	.	.	.	.	8.13	.
Bottom of Screen-Depth	53.0	147.0	143.0	90.0	.	.	8.4	24.6
Bottom-Depth	54.0	148.0	145.0	92.0	105.4	121.2	9.0	25.4
Top-Elevation	.	.	.	.	963.43	922.00	925.92	947.68
Midpoint-Elevation	.	.	.	.	.	.	922.92	941.08
Pump Intake-Elevation	928.40	848.14	841.94	919.69	.	.	920.19	.
Bottom-Elevation	.	.	.	.	883.33	818.80	919.32	934.48
Screen Length	30	50	30	30	.	.	5	10
Screen Material	SS/sw	SS/sw	SS/sw	SS/sw	.	.	SS/sw	PVC/sl
Slot Size	0.01	0.01	0.01	0.01	.	.	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.

APPENDIX D

CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME

EXPLANATION

Sampling Point:

BCK	-	Bear Creek Kilometer
EMW-VWUNDER	-	outfall for an underdrain installed to lower the water table and relieve hydrostatic pressure beneath the EMWMF liner.
GW	-	Monitoring Well
NT	-	Northern Tributary (Bear Creek)
SS	-	South Side (of Bear Creek, spring sampling station)

Location:

BG	-	Bear Creek Burial Grounds
EMWMF	-	Environmental Management Waste Management Facility
EXP	-	Exit Pathway Monitoring Location: Maynardville Limestone Picket (-A, -B, -C, -W) Spring or Surface Water Location (-SW)
OLF	-	Oil Landfarm
RS	-	Rust Spoil Area
S3	-	S-3 Site
SPI	-	Spoil Area I

Monitoring Program:

BJC	-	managed by Bechtel Jacobs Company LLC
GWPP	-	managed by Y-12 Groundwater Protection Program

Sample Type:

Dup	-	Field duplicate sample

Units:

ft	-	feet (elevations are above mean sea level and depths are below grade)
µg/L	-	micrograms per liter
mg/L	-	milligrams per liter
mV	-	millivolts
µmho/cm	-	micromhos per centimeter
NTU	-	Nephelometric Turbidity Units
pCi/L	-	picoCuries per liter
ppm	-	parts per million

EXPLANATION (continued)

Only the analytes that were detected above the program reporting limits in at least one sample are included in this appendix. Additionally, results that are below the reporting limits are replaced with missing values (e.g., “ < “) to emphasize the detected results. The following sections describe the reporting limits and data qualifiers for each sub-appendix. A comprehensive list of the GWPP analytes, analytical methods, and reporting limits is provided in Appendix B, Table B.5.

D.1 Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals:

Results for all of the field measurements, miscellaneous analytes, and major ions are included in this appendix. The reporting limits for the major ions are shown in the following summary.

Analyte	Reporting Limit (mg/L)		Analyte	Reporting Limit (mg/L)	
	GWPP	BJC		GWPP	BJC
Cations			**Anions**		
Calcium	0.2	0.25	Bicarbonate	1.0	NS
Magnesium	0.2	0.05	Carbonate	1.0	NS
Potassium	2.0	0.25	Chloride	0.2	0.1
Sodium	0.2	0.25	Fluoride	0.1	0.05
			Nitrate (as Nitrogen)	0.028	0.1
			Sulfate	0.25	0.1
Note: “NS” - not specified.					

The major ion results for the following samples are qualitative because the ion charge balance error (percent difference between summed cation charge and summed anion charge) exceeds 20%.

The Y-12 GWPP sampling and analysis plan (SAP) for CY 2007 (BWXT 2006a) specifies trace metal reporting limits and analytical methods that are appropriate for DOE Order monitoring. The laboratories subcontracted by monitoring programs managed by BJC may use reporting limits (sometimes reporting estimated values) that are lower than the GWPP reporting limits for the metals. For this report, the analytical methods for metals used by BJC monitoring programs (EPA-7470, SW846-6010B, SW846-6020, and ASTM-D5174-M) are considered to be functionally equivalent to the methods used by the GWPP (Table B.5). To retain the highest quality data for DOE Order monitoring purposes and to standardize reporting limits for trace metal results obtained from all sources, the GWPP reporting limits were given precedence over the BJC reporting limits (BJC 2006) shown on the following page. The trace metals shown in bold typeface below were detected in at least one groundwater or surface water sample collected during CY 2007 and are presented in Appendix D.1.

EXPLANATION (continued)

Analyte	Reporting Limit (mg/L)		Analyte	Reporting Limit (mg/L)	
	GWPP	BJC		GWPP	BJC
Aluminum	0.2	0.05*	**Lithium**	0.01	0.01
Antimony	0.0025	0.003	**Manganese**	0.005	0.005
Arsenic	0.005	0.005	**Mercury**	0.0002	0.0002
Barium	0.004	0.005	Molybdenum	0.05	0.01*
Beryllium	0.001	0.001	**Nickel**	0.005	0.01
Boron	0.1	0.01*	**Selenium**	0.01	0.0025*
Cadmium	0.0025	0.00013*	Silver	0.02	0.0015*
Chromium	0.01	0.005*	**Strontium**	0.005	0.005
Cobalt	0.02	0.005*	**Thallium**	0.0005	0.001
Copper	0.02	0.005*	Thorium	0.2	NS
Iron	0.05	0.01*	**Uranium**	0.0005	0.004
Lead	0.0005	0.002	Vanadium	0.02	0.01*
			Zinc	0.05	0.01*

Note: * - the GWPP reporting limit is used instead of the BJC reporting limit; "NS" - not specified.

Groundwater samples collected from the following wells for metals analysis during CY 2007 were diluted before analysis to obtain an optimum matrix. The detected results are valid, but some metals may be present at concentrations below the elevated reporting limits.

Sampling Location	Date Sampled	Dilution Factor	Sampling Location	Date Sampled	Dilution Factor
GW-246	03/22/07	10	GW-615	05/14/07	10
GW-246	08/15/07	10			

The following symbols and data qualifiers are used in Appendix D.1:

- . - Not analyzed or not applicable
- < - Analyzed but not detected at the project reporting level
- J - Positively identified; estimated concentration
- Q - Result is inconsistent with historical measurements for the location
- * - Field measurements obtained on a previous date, as shown below:

Sampling Location	Date Sampled	Field Measurements	Sampling Location	Date Sampled	Field Measurements
GW-363	02/28/07	02/27/08	GW-921	02/27/07	02/26/07
GW-363	04/26/07	04/25/07	GW-923	02/28/08	02/26/08
GW-363	11/14/07	11/13/07	GW-923	04/24/07	04/23/07
GW-639	04/19/07	04/17/08	GW-925	04/24/07	04/23/07
GW-639	11/15/07	11/14/07	GW-925	08/08/07	08/07/07
GW-916	08/14/07	08/13/07	GW-925	11/07/07	11/06/07

EXPLANATION (continued)

D.2 Volatile Organic Compounds:

The Y-12 GWPP reporting limits for volatile organic compounds (Table B.5) and those used for monitoring programs managed by BJC are contract-required quantitation limits. Results below the quantitation limit and above the instrument detection limit are reported as estimated quantities. Therefore, non-detected results are assumed to equal zero for all compounds.

As summarized below, 30 compounds were detected in the CY 2007 groundwater and surface water samples collected in the Bear Creek Regime. Results for these compounds are grouped by similar chemical composition (e.g., chloroethenes) in Appendix D.2.

Compound	No. Detected	Maximum (μg/L)	Compound	No. Detected	Maximum (μg/L)
Trichloroethene	50	4,500	1,2-Dichloroethane	9	21
cis-1,2-Dichloroethene	47	6,600	Chloroethane	8	33
Tetrachloroethene	37	17,000	Acetone	7	23
1,1-Dichloroethene	29	320	Total Xylene	5	15
1,1-Dichloroethane	24	4,100	Dichlorodifluoromethane	4	28
Vinyl chloride	19	1,400	Carbon tetrachloride	4	4 J
Benzene	16	2,200	1,1,2-Trichloroethane	3	6
trans-1,2-Dichloroethene	14	69	Ethylbenzene	3	4 J
Methylene chloride	17	16	1,4-Dioxane	2	130
1,1,1-Trichloroethane	12	1,700	Chlorobenzene	2	14
Toluene	11	46	Trichlorofluoromethane	1	13
Chloroform	10	72	1,4-Dichlorobenzene	1	3 J
1,1,2-Trichloro-1,2,2-trifluoroethane	9	720	Carbon disulfide	1	2 J

The following symbols and data qualifiers are used in Appendix D.2.

. - Not analyzed
< - Analyzed but not detected (also false-positive results)
B - Also detected in the associated method blank sample
J - Positively identified, estimated concentration below the contract-required quantitation limit
Q - Result is inconsistent with historical measurements for the location

EXPLANATION (continued)

D.3 Radiological Analytes:

Reporting limits for radiological analytes are sample-specific and analyte-specific minimum detectable activities that are reported with each result. Quarterly monitoring at the EMWMF during CY 2007 includes analyses for 34 isotopes with low detection limits. The following summary shows the primary radiological analytes relevant to DOE Order monitoring collected during CY 2007 in the Bear Creek Regime.

Analyte	No. of Results	No. Detected	Analyte	No. of Results	No. Detected
Gross Alpha	86	40	Technetium-99	97	17
Gross Beta	86	44	Uranium-234*	100	80
Americium-241	73	9	Uranium-235*	100	29
Neptunium-237	73	8	Uranium-236	4	4
Total Radium Alpha	2	2	Uranium-238	100	56
Strontium-89/90*	73	9			

Note: * = Reported by BJC laboratories in Appendix D.3 as equivalent GWPP analytes:
Sr-90 = Sr-89/90; U-233/234 = U-234; U-235/236 = U-235.

All of the results for gross alpha and gross beta are presented in the first two pages of Appendix D.3, followed by results for the primary isotopes shown above (pages D.3-3 through D.3-11).

The additional isotopic data obtained for sampling locations at the EMWMF are summarized below.

Analyte	No. of Results	No. Detected	Analyte	No. of Results	No. Detected
Actinium-227	71	6	Plutonium-236	71	5
Americium-243	71	17	Plutonium-238	71	4
Carbon-14	71	1	Plutonium-239/240	71	8
Cesium-137	71	1	Plutonium-241	71	1
Chlorine-36	71	1	Plutonium-242	71	10
Cobalt-60	71	0	Plutonium-244	71	0
Curium-242	71	2	Potassium-40	71	3
Curium-243/244	71	3	Radium-226	71	35
Curium-245	71	25	Radium-228	71	15
Curium-246	71	25	Thorium-227	71	6
Curium-247	71	11	Thorium-228	71	10
Curium-248	71	5	Thorium-229	71	6
Europium-152	71	0	Thorium-230	71	11
Europium-154	71	0	Thorium-232	71	10
Europium-155	71	0	Tritium	71	4
Iodine-129	71	7	Uranium-232	68	6
Nickel-63	71	0	Yttrium-90	71	7

Results for the isotopes that exceed the MDA (shown above as detected) are presented after the primary isotopic data (beginning on page D.3-12).

EXPLANATION (continued)

The following notes and qualifiers apply to Appendix D.3:

Activity	-	Result in picoCuries per liter (pCi/L)
TPU	-	Total propagated uncertainty (two standard deviations); calculation includes the counting error (instrument uncertainty) as reported previously, plus other sources of uncertainty (e.g., volumetric, chemical yield)
MDA	-	Minimum detectable activity
.	-	Not analyzed
<	-	Analyzed but less than the MDA (not detected)
Q	-	Result is inconsistent with historical measurements for the location
R	-	Result does not meet data quality objectives: exceeds the MDA but is less than the TPU.

Additional Analytes Not Presented in Appendix D tables:

As shown below, a few semivolatile organic compounds were detected in at least one sample from most of the locations at the Environmental Management Waste Management Facility.

Sampling Location	Date Sampled	Compound	Result (µg/L)
GW-363	02/28/07	Bis(2-ethylhexyl)phthalate	2 J
GW-363	02/28/07	Di-n-butylphthalate	1 J
GW-363	04/26/07	Bis(2-ethylhexyl)phthalate	0.6 J
GW-363	04/26/07	Di-n-butylphthalate	1 J
GW-363	08/15/07	Di-n-butylphthalate	0.5 J
GW-639	02/14/07	Bis(2-ethylhexyl)phthalate	1 J
GW-639	04/19/07	Indeno(1,2,3-cd)pyrene	0.7
GW-639	08/14/07	Di-n-butylphthalate	0.6 J
GW-916	11/07/07	Di-n-butylphthalate	0.6 J
GW-917	04/18/07	Indeno(1,2,3-cd)pyrene	0.7
GW-918	04/16/07	Dimethylphthalate	0.9 J
GW-918	08/14/07	Di-n-butylphthalate	1 J
GW-921	11/06/07	Di-n-butylphthalate	0.5 J
GW-922	11/06/07	Di-n-butylphthalate	0.6 J
GW-923	02/28/07	Bis(2-ethylhexyl)phthalate	3 J
GW-924	08/13/07	Di-n-butylphthalate	0.8 J
GW-926	11/12/07	Di-n-butylphthalate	0.7 J
GW-927	04/18/07	Indeno(1,2,3-cd)pyrene	0.7
EMW-VWUNDER	04/26/07	Bis(2-ethylhexyl)phthalate	0.5 J
EMW-VWUNDER	04/26/07	Di-n-butylphthalate	1 J
EMWNT-03A	11/06/07	Di-n-butylphthalate	0.8 J
NT-04	04/16/07	Dibenzo(a,h)anthracene	0.6
NT-04	11/06/07	Benzoic acid	0.9 J

Because the concentrations are very low (most are estimated values) and the compounds are typically detected in only one sample from a location, these results may be analytical artifacts.

APPENDIX D.1

FIELD MEASUREMENTS, MISCELLANEOUS ANALYTES, MAJOR IONS, AND TRACE METALS

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-008		GW-014			GW-046		GW-052	GW-053
Functional Area	OLF		BG			BG		BG	BG
Date Sampled	01/02/07	07/02/07	03/26/07	08/07/07		01/03/07	07/02/07	02/12/07	02/13/07
Program	BJC	BJC	GWPP	GWPP	GWPP	BJC	BJC	GWPP	GWPP
Sample Type					Dup				
Field Measurements									
Time Sampled	13:35	13:30	10:25	9:15	9:15	10:00	14:05	9:30	10:30
Measuring Point Elev. (ft)	965.39	965.39	934.50	934.50	934.50	921.17	921.17	905.70	903.42
Depth to Water (ft)	14.42	16.56	6.81	8.28	8.28	4.02	5.52	16.50	8.85
Groundwater Elevation (ft)	950.97	948.83	927.69	926.22	926.22	917.15	915.65	889.20	894.57
Conductivity (μmho/cm)	222	135	924	598	598	212	110	506	694
Dissolved Oxygen (ppm)	1.21	1.21	1.46	0.34	0.34	0.42	0.24	1.02	1.69
Oxidation/Reduction (mV)	118	128	115	78	78	202	180	170	102
Temperature (degrees C)	17	18	14.3	19.4	19.4	14.5	18.1	11.1	10.1
Turbidity (NTU)	1	2	.	.	.	3	6	.	.
pH	5.77	6.02	7.04	7	7	5.56	5.37	6.69	7.1
Miscellaneous Analytes									
Dissolved Solids (mg/L)	.	.	348	350	359	.	.	271	353
Suspended Solids (mg/L)	.	.	<	<	<	.	.	2	12
Turbidity (NTU)	.	.	0.414	1.36	1.39	.	.	1.33	8.07
Major Ions (mg/L)									
Calcium	13.2	20.9 J	93.7	96.6	92.5	.	.	73.8	107
Magnesium	7.32	11.8	14.8	14.7	14.1	.	.	11.3	13.7
Potassium	1.16	1.21	<	<	<	.	.	<	2.2
Sodium	2.74	3.59	9.58	10.8	9.47	.	.	6.36	7.9
Bicarbonate	.	.	328	270	275	.	.	201	303
Carbonate	.	.	<	<	<	.	.	<	<
Chloride	.	.	7.34	13.8	13.4	.	.	8.95	12.9
Fluoride	.	.	<	<	<	.	.	0.147	<
Nitrate as N	.	.	<	<	<	.	.	2.02	<
Sulfate	.	.	6.76	5.99	5.79	.	.	26.6	11.3
Charge balance error (%)	.	.	-4.5	4.8	1.6	.	.	-0.9	1.6
Trace Metals (mg/L)									
Aluminum	<	<	<	<	<	.	.	<	0.286
Arsenic	<	<	<	<	<	.	.	<	<
Barium	0.093	0.121	0.542	0.568	0.546	.	.	0.0768	0.19
Beryllium	<	<	<	<	<	.	.	<	<
Boron	<	<	3.36	3.56	3.43	.	.	<	0.266
Cadmium	<	<	<	<	<	.	.	<	<
Chromium	<	<	0.0108	<	<	.	.	<	<
Cobalt	0.0241	0.0393	<	<	<	.	.	<	<
Copper	<	<	<	<	<	.	.	<	<
Iron	3.07	5.31 J	<	0.0615	0.0606	.	.	0.115	0.951
Lead	<	<	0.00097	0.00203	0.00183	.	.	<	0.00489
Lithium	<	<	0.0286	0.0285	0.0274	.	.	<	0.396
Manganese	2.37	3.82 J	0.248	0.797	0.777	.	.	<	0.0832
Mercury	<	<	<	<	<	.	.	<	<
Nickel	0.0265	0.0386	0.00897	0.0126	0.0124	.	.	<	0.0243
Selenium	<	<	<	<	<	.	.	<	<
Strontium	0.0328	0.0517	0.35	0.346	0.331	.	.	0.132	0.399
Thallium	<	<	<	<	<	.	.	<	<
Uranium	<	<	0.0024	0.0013	0.0012	<	<	0.0456	0.00226
Zinc	<	<	<	<	<	.	.	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-071			GW-072	GW-077		GW-078		GW-079	
Functional Area	BG			BG	BG		BG		BG	
Date Sampled	03/21/07		08/09/07	03/21/07	03/07/07	07/31/07	03/07/07	07/31/07	03/07/07	07/31/07
Program	GWPP	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup								
Field Measurements										
Time Sampled	9:00	9:00	9:00	10:50	9:45	10:00	10:20	10:35	.	13:50
Measuring Point Elev. (ft)	928.90	928.90	928.90	930.51	919.30	919.30	918.10	918.10	.	981.20
Depth to Water (ft)	7.95	7.95	10.00	11.08	6.21	10.67	5.26	9.78	.	23.65
Groundwater Elevation (ft)	920.95	920.95	918.90	919.43	913.09	908.63	912.84	908.32	.	.
Conductivity (μmho/cm)	1,643	1,643	1,583	623	225	699	242	1,059	.	473
Dissolved Oxygen (ppm)	0.23	0.23	0.72	1.57	3.25	1.36	6.82	1.66	.	1.14
Oxidation/Reduction (mV)	-365	-365	-284	-129	96	123	112	62	.	-110
Temperature (degrees C)	12.5	12.5	21.4	16.1	11.9	22.8	14.9	16.5	.	16.6
Turbidity (NTU)	.	.	.	.	1	2	4	1	.	1
pH	10.68	10.68	10.03	9.44	7.23	7.62	7.46	7.83	.	7.89
Miscellaneous Analytes										
Dissolved Solids (mg/L)	891	888	888	316	239	219	252	229	162	131
Suspended Solids (mg/L)	<	<	<	3	8	<	6	8	7	<
Turbidity (NTU)	1.5	1.47	1.16	3.36	.	.	.	.	.	.
Major Ions (mg/L)										
Calcium	1.26	1.44	1.75	2.5	.	.	.	.	.	.
Magnesium	<	<	<	1.05	.	.	.	.	.	.
Potassium	2.67	2.57	3	2.56	.	.	.	.	.	.
Sodium	359	370	384	121	.	.	.	.	.	.
Bicarbonate	348	341	370	229	.	.	.	.	.	.
Carbonate	377	360	249	<	.	.	.	.	.	.
Chloride	42.9	43.1	47.6	31.9	.	.	.	.	.	.
Fluoride	5.6	5.46	5.6	0.357	.	.	.	.	.	.
Nitrate as N	<	<	<	<	.	.	.	.	.	.
Sulfate	20.5	24.8	27.4	7.65	.	.	.	.	.	.
Charge balance error (%)	-3.5	-0.8	6.9	-1.3	.	.	.	.	.	.
Trace Metals (mg/L)										
Aluminum	0.317	0.372	0.273	0.233	.	.	.	.	.	.
Arsenic	0.0119	0.012	0.0148	<	.	.	.	.	.	.
Barium	0.0784	0.0802	0.0824	0.196	.	.	.	.	.	.
Beryllium	<	<	<	<	.	.	.	.	.	.
Boron	0.734	0.757	0.809	0.297	.	.	.	.	.	.
Cadmium	<	<	<	0.0054 Q	.	.	.	.	.	.
Chromium	<	<	<	0.0404	.	.	.	.	.	.
Cobalt	<	<	<	<	.	.	.	.	.	.
Copper	<	<	<	<	.	.	.	.	.	.
Iron	0.0873	<	<	0.686	.	.	.	.	.	.
Lead	0.00086	0.00088	0.0045	0.0288 Q	.	.	.	.	.	.
Lithium	0.164	0.164	0.159	0.0735	.	.	.	.	.	.
Manganese	<	<	<	0.012	.	.	.	.	.	.
Mercury	<	<	<	<	.	.	.	.	.	.
Nickel	<	<	<	0.0378	.	.	.	.	.	.
Selenium	<	<	<	<	.	.	.	.	.	.
Strontium	0.196	0.203	0.204	0.309	.	.	.	.	.	.
Thallium	<	<	<	<	.	.	.	.	.	.
Uranium	<	<	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	.	.	.	.	.	.

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-080				GW-082	GW-085		GW-089		GW-098
Functional Area	BG				BG	OLF		BG		OLF
Date Sampled	03/07/07		07/31/07		02/07/07	03/22/07	08/15/07	02/12/07		04/23/07
Program	BJC	BJC	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type		Dup		Dup					Dup	
Field Measurements										
Time Sampled	10:30	.	14:30	.	10:05	9:10	10:10	11:20	11:20	10:00
Measuring Point Elev. (ft)	.	.	981.00	.	964.00	983.57	983.57	964.36	964.36	945.95
Depth to Water (ft)	.	.	23.45	.	21.39	13.83	16.47	7.52	7.52	11.22
Groundwater Elevation (ft)	.	.	.	.	942.61	969.74	967.10	956.84	956.84	934.73
Conductivity (μmho/cm)	.	.	443	.	942	1,105	1,059	395	395	1,375
Dissolved Oxygen (ppm)	.	.	8.21	.	1.65	1	0.86	1.12	1.12	0.36
Oxidation/Reduction (mV)	.	.	-36	.	69	152	157	144	144	62
Temperature (degrees C)	.	.	19.4	.	9.3	16.1	18.4	13.2	13.2	17
Turbidity (NTU)	.	.	9	.	.	.	.	.	.	.
pH	.	.	7.41	.	6.87	6.91	6.9	7.94	7.94	6.48
Miscellaneous Analytes										
Dissolved Solids (mg/L)	115	133	103	116	533	757	698	213	204	747
Suspended Solids (mg/L)	44	29	15	12	2	7	<	6	6	<
Turbidity (NTU)	.	.	.	.	4.24	5.63	1.21	5.34	5.36	1.33
Major Ions (mg/L)										
Calcium	.	.	.	.	149	166	137	52.5	53.5	211
Magnesium	.	.	.	.	17.9	11.5	9.22	10.1	10.1	31.9
Potassium	.	.	.	.	<	<	<	2.44	2.44	5.2
Sodium	.	.	.	.	8.87	10	8.66	6.95	7.02	30.2
Bicarbonate	.	.	.	.	327	217	196	166	166	560
Carbonate	.	.	.	.	<	<	<	<	<	<
Chloride	.	.	.	.	83.5	6.16	5.57	1.9	1.97	114
Fluoride	.	.	.	.	<	<	<	0.174	0.175	<
Nitrate as N	.	.	.	.	0.0384	75.8	52	0.0497	0.0587	<
Sulfate	.	.	.	.	6.7	7.68	7.44	14.7	14.9	19.4
Charge balance error (%)	.	.	.	.	1.4	-2.1	0.2	1.7	2.3	-0.7
Trace Metals (mg/L)										
Aluminum	.	.	.	.	<	0.729	<	<	<	<
Arsenic	.	.	.	.	<	<	<	<	<	<
Barium	.	.	.	.	0.851	0.5	0.394	0.233	0.235	0.697
Beryllium	.	.	.	.	<	<	<	<	<	<
Boron	.	.	.	.	13.7	<	<	<	<	0.204
Cadmium	.	.	.	.	<	<	<	<	<	<
Chromium	.	.	.	.	0.0401	<	<	0.0148	0.0136	<
Cobalt	.	.	.	.	<	<	<	<	<	<
Copper	.	.	.	.	<	<	<	<	<	<
Iron	.	.	.	.	0.482	0.452	0.13	0.65	0.631	0.163
Lead	.	.	.	.	0.00618	0.00286	0.0053	0.0193	0.0183	0.00382
Lithium	.	.	.	.	0.02	0.0222	0.0173	0.0234	0.0227	0.0376
Manganese	.	.	.	.	0.732	0.0152	0.00653	0.81	0.745	0.817
Mercury	.	.	.	.	<	<	<	<	<	<
Nickel	.	.	.	.	0.052	<	<	0.0276	0.025	0.0498
Selenium	.	.	.	.	<	<	<	<	<	<
Strontium	.	.	.	.	0.288	0.419	0.326	0.266	0.269	1.31
Thallium	.	.	.	.	<	<	<	<	<	<
Uranium	<	<	<	<	<	<	<	<	<	0.00124
Zinc	.	.	.	.	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-100		GW-101	GW-122	GW-127	GW-225		GW-226		GW-229
Functional Area	S3		S3	S3	S3	OLF		OLF		OLF
Date Sampled	05/07/07		05/09/07	05/09/07	05/07/07	03/20/07	08/13/07	03/20/07	08/13/07	04/23/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type		Dup								
Field Measurements										
Time Sampled	9:00	9:00	10:50	9:15	10:45	9:55	8:25	8:40	9:50	11:00
Measuring Point Elev. (ft)	987.40	987.40	1,007.40	1,007.20	1,005.90	943.11	943.11	943.57	943.57	949.00
Depth to Water (ft)	5.73	5.73	9.55	16.84	13.46	9.67	18.92	9.08	19.55	15.78
Groundwater Elevation (ft)	981.67	981.67	997.85	990.36	992.44	933.44	924.19	934.49	924.02	933.22
Conductivity (μmho/cm)	1,807	1,807	960	2,350	911	1,017	1,023	987	864	1,612
Dissolved Oxygen (ppm)	1.47	1.47	0.21	0.12	2.39	0.07	0.15	0.47	0.25	0.06
Oxidation/Reduction (mV)	212	212	-15	147	177	130	135	166	21	-55
Temperature (degrees C)	15.6	15.6	20.6	18.7	15.8	13.2	16.8	11.5	18.4	16.6
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.
pH	6.65	6.65	6.9	6.66	6.77	7.22	7.26	6.76	7.1	6.33
Miscellaneous Analytes										
Dissolved Solids (mg/L)	1,160	1,210	705	2,060	530	603	638	615	505	879
Suspended Solids (mg/L)	2	2	7	<	<	<	<	3	2	15
Turbidity (NTU)	2.39	2.42	14.5	2.61	0.858	1.82	4.79	18.1	13.2	198
Major Ions (mg/L)										
Calcium	288	283	169	321	121	118	121	149	98.6	182
Magnesium	22.2	22.1	28.3	100	20.9	50.4	50.7	39.1	36.8	34.2
Potassium	2.45	2.55	2.53	20.6	<	3.1	2.87	3.15	4.25	12.8
Sodium	6.96	6.91	18	93.7	39.8	27.2	27.8	21.3	27.8	72.8
Bicarbonate	251	247	464	415	399	248	230	482	228	636
Carbonate	<	<	<	<	<	<	<	<	<	<
Chloride	320	317	12.7	86.2	32.9	85.2	90.3	45.9	77.7	134
Fluoride	<	<	0.266	<	0.41	0.466	0.482	<	<	0.126
Nitrate as N	35.5	35.8	25.7	252	0.237	42.5	40.7	8.22	26.7	<
Sulfate	19.3	19.6	15	18.9	50	49.3	49.8	19.2	29.2	17.2
Charge balance error (%)	-1.2	-1.6	-0.8	-0.5	-2.5	-0.7	1.7	-1.1	0	-4.5
Trace Metals (mg/L)										
Aluminum	<	<	0.425	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	0.0115
Barium	0.666	0.662	0.616	0.989	0.0241	0.182	0.183	0.238	0.154	1.29
Beryllium	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	0.386	<	0.113	0.124	0.171	0.1	3.16
Cadmium	<	<	<	<	<	<	<	<	<	<
Chromium	0.168 Q	0.158 Q	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	0.161	0.329	2.23	0.526	<	0.293	0.891	2.15	1.74	22.9
Lead	0.00134	0.0014	0.0012	0.000525	<	0.00372	0.0028	0.00056	0.0945 Q	0.00605
Lithium	0.0192	0.0185	<	0.153	<	0.0223	0.0207	0.0164	0.0172	0.12
Manganese	0.0594	0.0559	3.54	0.0711	0.382	0.0113	0.0555	1.25	0.142	6.28
Mercury	<	<	0.000306	<	<	<	<	<	<	0.000206
Nickel	0.0211	0.0203	0.00588	0.00928	<	<	<	0.00713	<	0.0548
Selenium	<	<	<	<	<	<	<	<	<	0.0106
Strontium	0.537	0.533	0.716	11.2	0.268	1.89	1.83	0.545	0.615	0.554
Thallium	<	<	<	<	<	<	<	<	<	<
Uranium	0.00147	0.00146	0.0042	0.0018	0.0282	0.00288	0.00271	0.0125	0.00424	0.172
Zinc	<	<	<	0.124	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-236	GW-246		GW-257	GW-276		GW-277	GW-289	GW-307
Functional Area	S3	S3		BG	S3		S3	BG	RS
Date Sampled	05/03/07	03/22/07	08/15/07	02/08/07	01/03/07	07/09/07	05/14/07	02/08/07	05/01/07
Program	GWPP	GWPP	GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP
Sample Type									
Field Measurements									
Time Sampled	10:40	10:15	8:40	9:20	11:30	11:00	10:50	10:20	9:00
Measuring Point Elev. (ft)	983.21	1,009.19	1,009.19	961.68	1,001.57	1,001.57	1,001.76	948.73	993.14
Depth to Water (ft)	11.22	13.73	14.50	28.58	5.87	7.94	6.21	17.32	30.39
Groundwater Elevation (ft)	971.99	995.46	994.69	933.10	995.70	993.63	995.55	931.41	962.75
Conductivity (μmho/cm)	847	18,490	19,690	325	396	522	6,290	351	835
Dissolved Oxygen (ppm)	0.19	0.18	0.19	0.99	7.65	1.2	0.15	0.42	0.37
Oxidation/Reduction (mV)	295	385	371	162	255	254	203	135	180
Temperature (degrees C)	14.9	17.5	19.3	15.1	12	23.8	19.1	15.1	15.7
Turbidity (NTU)	.	.	.	.	1	8	.	.	.
pH	5.26	4.35	4.5	6.45	4.94	5.81	6.3	6.62	6.52
Miscellaneous Analytes									
Dissolved Solids (mg/L)	532	17,900	17,000	178	.	.	3,700	173	534
Suspended Solids (mg/L)	5	<	2	<	.	.	<	<	<
Turbidity (NTU)	4.09	0.118	0.335	0.27	.	.	0.251	0.088	0.491
Major Ions (mg/L)									
Calcium	105	2810	2740	48.8	41.4	67.8	761	45.1	159
Magnesium	14	613	576	4.11	7.09	10.5	126	5.59	16.1
Potassium	3.23	37.1	33.7	<	6.6	5.04	8.3	<	4.1
Sodium	19.9	509	481	8.82	59.1	59	127	5.35	12.3
Bicarbonate	56.7	49.8	42.1	131	.	.	540	128	371
Carbonate	<	<	<	<	.	.	<	<	<
Chloride	21.6	306	300	1.57	.	.	95.1	2.37	26.7
Fluoride	0.306	30.1	4.41	0.118	.	.	<	<	<
Nitrate as N	52.7	3,130	3,200	0.296	19.4	29.6	503	0.314	1.06
Sulfate	84.7	23.4	22.4	9.63	.	.	100 Q	8.52	87.8
Charge balance error (%)	0.4	-4.8	-7.3	4.4	.	.	2.5	2.1	-0.9
Trace Metals (mg/L)									
Aluminum	0.678	73.9	61.7	<	1.73	0.804	<	<	<
Arsenic	<	<	<	<	<	<	0.186	<	<
Barium	0.0803	3.92	4.53	0.112	0.0794	0.1	0.375	0.109	0.0754
Beryllium	0.000886	0.0389	0.0323	<	0.0024	0.0014	<	<	<
Boron	<	<	<	<	<	<	<	<	<
Cadmium	<	0.39	0.304	<	0.0099	0.0074	<	<	<
Chromium	<	<	<	<	<	<	<	<	<
Cobalt	<	0.566	0.508	<	0.0482	0.024	<	<	<
Copper	<	<	<	<	<	<	<	<	<
Iron	0.169	<	<	<	<	<	<	<	<
Lead	<	0.00141	0.00148	<	<	<	<	<	<
Lithium	<	0.78	0.685	<	0.0165	0.011	0.0928	<	<
Manganese	2.11	122	109	<	2.22	1.82	3.32	<	0.0629
Mercury	<	0.000918	0.00063	<	0.00024	<	<	<	<
Nickel	0.0214	3.9	3.3	<	0.125	0.102	0.0307	<	<
Selenium	<	<	<	<	<	<	2.69	<	<
Strontium	0.24	10.5	9.89	0.078	0.0925	0.149	2.25	0.0883	0.257
Thallium	<	<	<	<	<	<	<	<	<
Uranium	0.0144	0.672	0.463	<	0.45	0.21	0.0748 Q	<	0.00156
Zinc	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-313		GW-315	GW-363				GW-368	GW-369	GW-537
Functional Area	SPI		SPI	EMWMF				OLF	OLF	OLF
Date Sampled	05/01/07		05/01/07	02/28/07*	04/26/07*	08/15/07	11/14/07*	04/26/07	04/30/07	05/03/07
Program	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	GWPP	GWPP	GWPP
Sample Type		Dup								
Field Measurements										
Time Sampled	10:35	10:35	12:05	15:00	9:20	15:55	9:30	9:20	9:50	9:15
Measuring Point Elev. (ft)	1,059.74	1,059.74	1,047.45	957.91	957.91	957.91	957.91	1,000.53	999.72	976.65
Depth to Water (ft)	70.31	70.31	57.68	4.84	4.71	5.94	6.22	66.44	75.64	6.56
Groundwater Elevation (ft)	989.43	989.43	989.77	953.07	953.20	951.97	951.69	934.09	924.08	970.09
Conductivity (μmho/cm)	315	315	788	262	501	281	286	739	787	4,410
Dissolved Oxygen (ppm)	2.21	2.21	0.29	3.43	2.69	2.23	7	0.98	1.32	0.16
Oxidation/Reduction (mV)	154	154	138	121	69	92	73	146	162	190
Temperature (degrees C)	16.9	16.9	16.6	16.1	18.8	21.1	17.5	16	13.9	15.1
Turbidity (NTU)	.	.	.	1	2	7	7	.	.	.
pH	6.81	6.81	7.01	9.4	9.43	9.24	9.17	7.43	7.41	6.58
Miscellaneous Analytes										
Dissolved Solids (mg/L)	362	360	445	.	.	.	.	394	462	3,010
Suspended Solids (mg/L)	<	<	<	.	.	.	.	2	2	<
Turbidity (NTU)	0.219	0.218	0.143	.	.	.	.	24.6	10.8	0.515
Major Ions (mg/L)										
Calcium	107	106	132	1.19	1.26	1.97	1.24	72.7	89.9	691
Magnesium	25	25	16.1	0.468	0.497	0.887	0.529	38	41.5	55
Potassium	<	<	3.91	1.32	1.22	1.88	1.68	3.3	6.51	2.89
Sodium	1.96	1.94	8.6	108	111	96.4	108	16.3	16.3	39.4
Bicarbonate	367	378	306	.	.	.	.	228	216	333
Carbonate	<	<	<	.	.	.	.	<	<	<
Chloride	2.98	3.08	13.5	.	.	.	.	39.4	35.8	23.4
Fluoride	<	<	<	.	.	.	.	0.216	0.391	<
Nitrate as N	1.45	1.47	5.85	.	.	.	.	9.03	9.3	462
Sulfate	8.25	8.1	74	.	.	.	.	55.2	120	4.65
Charge balance error (%)	-1.4	-3.2	-0.4	.	.	.	.	0.5	1.5	0.5
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	0.283 Q	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.0287	0.0288	0.0685	0.0494	0.049	0.0671	0.0487	0.0666	0.112	1.76
Beryllium	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	0.319	0.324	0.29	0.332	<	<	<
Cadmium	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	<	<	<	0.142	0.298	0.807 Q	0.0631	3.03	1.45	<
Lead	<	<	0.000885	<	<	<	<	0.00294	<	<
Lithium	<	<	<	0.0506	0.0539	0.0483	0.0516	0.0193	0.0189	0.0392
Manganese	<	<	0.122	<	<	0.0067	<	0.00827	0.00557	<
Mercury	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<	0.018
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	0.0873	0.0869	0.222	0.0703	0.07	0.0878	0.0708	0.694	1.02	2
Thallium	<	<	<	<	0.0017 J	<	<	<	<	<
Uranium	<	<	0.00258	<	<	<	<	0.00164	<	0.00114
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-601	GW-615	GW-616	GW-626		GW-627		GW-629	
Functional Area	OLF	S3	S3	BG		BG		BG	
Date Sampled	04/24/07	05/14/07	05/10/07	03/19/07	08/02/07	03/19/07	08/06/07	01/09/07	08/06/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type									
Field Measurements									
Time Sampled	9:55	9:35	9:25	9:20	9:25	10:25	8:50	9:45	10:50
Measuring Point Elev. (ft)	1,002.80	1,017.55	1,011.81	942.87	942.87	943.51	943.51	928.03	928.03
Depth to Water (ft)	65.10	13.24	9.66	26.14	28.75	24.49	26.11	5.86	7.43
Groundwater Elevation (ft)	937.70	1,004.31	1,002.15	916.73	914.12	919.02	917.40	922.17	920.60
Conductivity (μmho/cm)	832	45,400	2,410	625	539	1,368	1,291	1,198	1,182
Dissolved Oxygen (ppm)	0.66	0.24	0.21	0.18	0.33	0.21	0.94	0.72	0.42
Oxidation/Reduction (mV)	99	132	-30	-13	135	-150	-142	-69	-140
Temperature (degrees C)	15.9	17.8	18.8	14.7	17.8	13.4	20	9.2	24.2
Turbidity (NTU)	.	.	.	.	.	.	.	.	.
pH	7.37	5.85	9.79	7.08	7.14	9.26	9.11	9.28	9
Miscellaneous Analytes									
Dissolved Solids (mg/L)	525	62,700	1,730	349	266	725	736	671	676
Suspended Solids (mg/L)	2	12	2	<	<	<	<	<	<
Turbidity (NTU)	10.3	1.61	11.4	0.604	0.135	0.316	0.279	0.972	0.536
Major Ions (mg/L)									
Calcium	88.8	9,800	2.03	100	85.5	1.27	1.54	1.17	1.22
Magnesium	41.8	2,530	0.754	6.64	5.83	0.241	0.263	0.226	0.227
Potassium	2.63	129	4.69	<	<	<	<	<	<
Sodium	38.1	2,290	478	6.25	5.8	297	310	284	294
Bicarbonate	225	326	55.3	263	209	582	448	582	463
Carbonate	<	<	62.6	<	<	<	125	<	69.7
Chloride	85.6	127	16.7	31.9	15.5	59.7	64.5	6.18	7.21
Fluoride	0.439	0.137	0.792	<	<	4.44	4.43	4.28	4.27
Nitrate as N	19.3	11,100	258	<	<	<	<	<	<
Sulfate	76.2	<	15.3	3.67	2.75	2.48	1.74	22.7	22.5
Charge balance error (%)	-1.6	-0.2	-1.4	-3.5	3.4	-2.3	0.1	-0.4	5.4
Trace Metals (mg/L)									
Aluminum	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<
Barium	0.0949	397	0.155	0.329	0.289	0.0494	0.0528	0.0571	0.0587
Beryllium	<	<	<	<	<	<	<	<	<
Boron	0.101	<	0.889	<	<	0.483	0.495	0.544	0.542
Cadmium	<	0.0225	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<
Iron	1.73	0.997	1.46	0.0665	<	0.102	0.113	0.0871	0.117
Lead	<	0.00106	0.00878	0.00122	<	0.0014	0.0143	<	0.0076
Lithium	0.0315	1.17	0.298	0.0208	0.019	0.102	0.0979	0.0832	0.0849
Manganese	0.0145	26.1	0.015	<	<	0.0131	0.0132	0.00546	0.00609
Mercury	<	<	<	<	<	<	<	<	<
Nickel	<	0.364	<	0.0714	0.0267	<	<	<	<
Selenium	<	0.0164	<	<	<	<	<	<	<
Strontium	1.62	300	0.29	0.219	0.186	0.0906	0.0904	0.0777	0.0784
Thallium	<	0.00059	<	<	<	0.000515	<	0.00074	<
Uranium	<	1.65	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-639				GW-653	GW-683		GW-684	
Functional Area	EMWMF				BG	EXP-A		EXP-A	
Date Sampled	02/14/07	04/19/07*	08/14/07	11/15/07*	02/07/07	03/07/07	08/01/07	03/07/07	07/26/07
Program	BJC	BJC	BJC	BJC	GWPP	BJC	BJC	BJC	BJC
Sample Type									
Field Measurements									
Time Sampled	15:00	13:30	15:20	9:30	9:05	13:30	9:30	13:30	14:40
Measuring Point Elev. (ft)	940.95	940.95	940.95	940.95	931.84	972.23	972.23	898.83	898.83
Depth to Water (ft)	11.04	10.09	12.87	13.13	23.61	88.74	88.95	15.45	15.80
Groundwater Elevation (ft)	929.91	930.86	928.08	927.82	908.23	883.49	883.28	883.38	883.03
Conductivity (μmho/cm)	1,063	977	507	544	39	507	503	282	936
Dissolved Oxygen (ppm)	2.3	1.17	1.56	4.3	4.93	4.15	2.86	3.05	0.78
Oxidation/Reduction (mV)	129	142	62	74	234	217	160	117	95
Temperature (degrees C)	7.1	16.8	20.9	16.5	12.3	15	15.8	13.7	16.1
Turbidity (NTU)	1	2	8	8	.	6	4	1	3
pH	9.1	9.44	9.57	9.29	5.28	7.31	7.84	7.63	7.79
Miscellaneous Analytes									
Dissolved Solids (mg/L)	.	.	.	.	34	275	288	300	269
Suspended Solids (mg/L)	.	.	.	.	<	6	5	7	5
Turbidity (NTU)	.	.	.	.	1.8	.	.	.	.
Major Ions (mg/L)									
Calcium	1.3	0.962	0.883	0.918	1.98	60.6	52.2 J	69.7	54.4
Magnesium	0.465	0.325	0.323	0.288	1.09	21.4	21.8	17.9	16
Potassium	1.78	1.53	2.36	1.42	<	1.1	1.08 J	4.32	3.43
Sodium	209	206	202	210	1.99	4.91	3.08	6.17	5.38
Bicarbonate	.	.	.	.	16.8	190	145	202	193
Carbonate	.	.	.	.	<	<	<	<	<
Chloride	.	.	.	.	1.08	9	5.7	12.3	13.5
Fluoride	.	.	.	.	<	0.11	0.22	0.19	0.16
Nitrate as N	.	.	.	.	<	4.7	2.1	3.8	2.8
Sulfate	.	.	.	.	1.32	21.5	17.7	16.5	14.5
Charge balance error (%)	.	.	.	.	-16.8	1.1	11.4	2.3	-4.8
Trace Metals (mg/L)									
Aluminum	<	<	0.25 Q	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<
Barium	0.0836	0.0637	0.0605	0.0624	0.0341	0.125	0.121	0.0944	0.0896
Beryllium	<	<	<	<	<	<	<	<	<
Boron	0.615	0.614	0.604	0.595	<	<	<	<	<
Cadmium	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	0.0139	<	<
Cobalt	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<
Iron	0.058	0.0655	0.506 Q	0.0536	0.164	<	0.0606 J	<	<
Lead	<	<	0.0033 Q	<	0.00358	<	<	<	<
Lithium	0.125	0.131	0.12	0.118	<	<	<	0.0255	0.0215
Manganese	<	<	<	<	<	<	<	0.0487	0.0615
Mercury	<	<	<	<	<	<	<	.	.
Nickel	<	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<
Strontium	0.136	0.0961	0.0868	0.0909	0.0178	0.137	0.141	0.174	0.152
Thallium	<	<	<	<	<	<	<	<	<
Uranium	<	<	<	<	<	.	.	.	.
Zinc	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-694		GW-703	GW-704		GW-706		GW-712	
Functional Area	EXP-B		EXP-B	EXP-B		EXP-B		EXP-W	
Date Sampled	08/16/07		08/16/07	03/08/07	08/01/07	03/08/07	08/01/07	01/02/07	07/02/07
Program	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup							
Field Measurements									
Time Sampled	8:45	8:45	10:10	14:15	11:00	9:45	9:25	10:50	11:15
Measuring Point Elev. (ft)	941.98	941.98	955.29	945.33	945.33	929.47	929.47	877.89	877.89
Depth to Water (ft)	31.87	31.87	46.15	31.66	36.29	13.45	18.35	32.69	34.79
Groundwater Elevation (ft)	910.11	910.11	909.14	913.67	909.04	916.02	911.12	845.20	843.10
Conductivity (μmho/cm)	458	458	563	247	742	458	1,494	279	288
Dissolved Oxygen (ppm)	0.18	0.18	0.79	4.76	0.66	2.83	0.47	1.91	1.45
Oxidation/Reduction (mV)	12	12	125	144	60	168	100	43	219
Temperature (degrees C)	15	15	19.1	15.7	17.6	12.2	17	11.4	17.9
Turbidity (NTU)	.	.	.	11	15	2	3	3	9
pH	7.3	7.3	7.4	7.26	9.13	7.2	7.24	7.75	8.01
Miscellaneous Analytes									
Dissolved Solids (mg/L)	248	249	374	375	225	442	485	.	.
Suspended Solids (mg/L)	2	3	<	<	8	<	<	.	.
Turbidity (NTU)	9.13	9.11	3.84	.	.	.	.	.	.
Major Ions (mg/L)									
Calcium	64.5	64.8	77.2	73.4	6.66 J	94.7	105 J	51.7	45.4 J
Magnesium	14.2	14.3	30.5	27.4	23.7	19.7	23.3	33.7	33.7
Potassium	<	<	4.81	2.78	14 J	6.22	6.22 J	2.35	2.33
Sodium	7.18	7.2	13.2	12.9	12.7	15.6	16	7.19	7.21
Bicarbonate	160	161	215	210	101	188	261	.	.
Carbonate	<	<	<	<	<	<	<	.	.
Chloride	12.4	12.1	25.5	27.7	25	37	36.6	.	.
Fluoride	0.187	0.184	0.157	0.18	0.32	0.24	0.39	.	.
Nitrate as N	7.73	7.42	18.2	14.6	1.2	24.2	16.4	<	<
Sulfate	16.5	16.7	26.5	23.1	16.3	27.9	22.1	.	.
Charge balance error (%)	2.7	3	1.3	-0.3	-0.4	0.1	0.4	.	.
Trace Metals (mg/L)									
Aluminum	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<
Barium	0.0779	0.0784	0.103	0.122	0.0157	0.141	0.153	0.0315	0.0329
Beryllium	<	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	0.122	<	<
Cadmium	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	0.0223	<	<
Iron	1.51	1.64	0.35	0.876	1.6 J	0.499	0.815 J	0.538	0.981 J
Lead	<	<	<	<	<	<	<	<	<
Lithium	<	<	0.0208	0.0148	0.0299	0.0191	0.0157	0.0106	0.0108
Manganese	0.0169	0.0178	<	0.0114	0.0247	<	0.012	0.138	0.135 J
Mercury	<	<	<	.	.	.	.	.	.
Nickel	<	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<
Strontium	0.136	0.135	0.261	0.297	0.0261	0.365	0.297	0.592	0.585
Thallium	<	<	<	<	<	<	<	<	<
Uranium	0.0383	0.0361	0.0122	0.016	<	0.066	0.061	<	<
Zinc	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-713				GW-714		GW-724	GW-725	GW-738	GW-740
Functional Area	EXP-W				EXP-W		EXP-C	EXP-C	EXP-C	EXP-C
Date Sampled	01/02/07		07/03/07		01/02/07	07/02/07	08/20/07	08/20/07	08/21/07	08/21/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP	GWPP	GWPP
Sample Type		Dup		Dup						
Field Measurements										
Time Sampled	16:30	.	13:30	.	10:30	10:50	10:35	8:30	9:00	10:15
Measuring Point Elev. (ft)	881.43	.	881.43	.	875.88	875.88	979.75	961.63	983.31	1,020.25
Depth to Water (ft)	35.68	.	37.80	.	28.98	31.08	34.23	14.68	32.12	75.32
Groundwater Elevation (ft)	845.75	.	843.63	.	846.90	844.80	945.52	946.95	951.19	944.93
Conductivity (μmho/cm)	250	.	305	.	578	546	711	855	913	512
Dissolved Oxygen (ppm)	3.5	.	2.22	.	0.95	1.31	0.1	0.13	0.45	2.3
Oxidation/Reduction (mV)	-154	.	-169	.	227	90	20.2	90	156	129
Temperature (degrees C)	10.4	.	19.2	.	9.2	19.2	16.3	16.4	16.9	16
Turbidity (NTU)	3	.	8	.	3	14	.	.	.	.
pH	7.96	.	8.04	.	7.66	7.57	7.3	6.9	6.9	7.2
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	.	.	.	.	430	544	515	319
Suspended Solids (mg/L)	.	.	.	.	.	.	<	<	<	<
Turbidity (NTU)	.	.	.	.	.	.	0.721	7.27	0.265	0.773
Major Ions (mg/L)										
Calcium	57.9	58.7	51.1	51.8	63.7	57.3 J	88.3	142	135	71.4
Magnesium	33.1	33.7	30.7	30.9	25.8	23.8	39	22.6	22.4	33.8
Potassium	2.86	2.86	2.41	2.38	1.43	1.36	2.48	2.95	2.73	<
Sodium	11.8	11.9	10.8	11.1	6.31	5.75	30.6	24.4	9.67	2.35
Bicarbonate	.	.	.	.	.	.	232	301	333	269
Carbonate	.	.	.	.	.	.	<	<	<	<
Chloride	.	.	.	.	.	.	71.2	53.7	22.6	7.16
Fluoride	.	.	.	.	.	.	0.204	0.24	<	0.161
Nitrate as N	<	<	<	<	0.36	0.24	16.1	13.1	19	1.95
Sulfate	.	.	.	.	.	.	31.7	40.2	34.4	12.3
Charge balance error (%)	.	.	.	.	.	.	3.1	4	-1.6	3.7
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.0422	0.043	0.0421	0.0431	0.0874	0.0812	0.169	0.201	0.064	0.0981
Beryllium	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	<	<	<
Cadmium	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	1.94	1.56	1.49	1.57	0.208	1.17 J	0.284	0.753	<	0.102
Lead	<	<	<	<	<	<	<	<	<	<
Lithium	0.0147	0.0147	0.0143	0.0152	<	<	0.0208	<	<	0.0164
Manganese	0.142	0.15	0.138	0.141	0.0329	0.0853 J	0.00893	0.861	0.0661	<
Mercury	.	.	.	.	.	.	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<	<
Selenium	<	0.0105	<	<	<	<	<	<	<	<
Strontium	1.13	1.14	1.07	1.08	0.348	0.33	1.17	0.332	0.152	0.0584
Thallium	<	<	<	<	<	<	<	<	<	<
Uranium	<	<	<	<	<	<	0.000715	0.0135	0.00325	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-916				GW-917				GW-918	
Functional Area	EMWMF				EMWMF				EMWMF	
Date Sampled	02/27/07	04/24/07	08/14/07*	11/07/07	02/22/07	04/18/07	08/09/07	11/05/07	02/27/07	04/16/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type										
Field Measurements										
Time Sampled	13:40	13:55	13:15	15:15	10:15	13:45	10:15	13:50	11:00	10:15
Measuring Point Elev. (ft)	1,002.85	1,002.85	1,002.85	1,002.85	997.10	997.10	997.10	997.10	1,067.96	1,067.96
Depth to Water (ft)	4.61	5.81	7.60	8.03	23.18	22.70	24.75	25.83	5.99	5.08
Groundwater Elevation (ft)	998.24	997.04	995.25	994.82	973.92	974.40	972.35	971.27	1,061.97	1,062.88
Conductivity (μmho/cm)	361	230	371	380	234	252	428	270	65	73
Dissolved Oxygen (ppm)	1.14	2.01	1.32	2.2	1.48	4.81	1.17	3.16	6.88	12.62
Oxidation/Reduction (mV)	-18	45	-8	98	120	-30	66	34	177	120
Temperature (degrees C)	15.2	15.1	17.1	15.3	17.1	17.9	18.2	16.8	15.3	14.4
Turbidity (NTU)	2	9	2	2	5	3	5	6	8	6
pH	7.59	7.71	7.66	7.71	7.58	7.29	7.96	7.58	7.99	6.42
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	.	.	.	.	.	.	.	.
Suspended Solids (mg/L)	.	.	.	.	.	.	.	.	.	.
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.
Major Ions (mg/L)										
Calcium	40.7	38.4	37.7	39	62.7	63.5	59.9	63.6	9.73	10.6
Magnesium	6.19	6.02	5.94	6.18	8.38	8.6	7.83	8.55	3.97	4.14
Potassium	3.26	3.44	3.75	4.02	1.32	1.27	1.3	1.47	1.82	1.83
Sodium	27	23.5	23.8	28.1	8.74	8.82	8.97	9.37	4.47	4.17
Bicarbonate	.	.	.	.	.	.	.	.	.	.
Carbonate	.	.	.	.	.	.	.	.	.	.
Chloride	.	.	.	.	.	.	.	.	.	.
Fluoride	.	.	.	.	.	.	.	.	.	.
Nitrate as N	.	.	.	.	.	.	.	.	.	.
Sulfate	.	.	.	.	.	.	.	.	.	.
Charge balance error (%)	.	.	.	.	.	.	.	.	.	.
Trace Metals (mg/L)										
Aluminum	0.349	0.536	0.238	0.551	0.456	<	0.454	0.373	0.205	0.561
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.153	0.123	0.125	0.162	0.177	0.175	0.171	0.181	0.115	0.118
Beryllium	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	<	<	<
Cadmium	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	0.512	0.75	0.426	0.469	0.624	0.199	0.858	0.337	0.188	0.462
Lead	<	<	<	<	<	<	<	<	<	<
Lithium	0.0707	0.0667	0.0748	0.0773	0.0174	0.0182	0.0178	0.0192	0.0125	0.0121
Manganese	0.0737	0.0787	0.158	0.0831	0.0336	0.0226	0.0594	0.0252	0.0061	0.019
Mercury	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	1.08	1.08	1.12	1.1	0.127	0.131	0.121	0.132	0.0474	0.047
Thallium	<	<	<	<	<	<	<	<	<	<
Uranium	<	<	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-918		GW-920				GW-921			
Functional Area	EMWMF		EMWMF				EMWMF			
Date Sampled	08/14/07	11/06/07	02/20/07	04/17/07	08/08/07	11/14/07	02/27/07*	04/23/07	08/07/07	11/06/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type										
Field Measurements										
Time Sampled	14:25	10:30	11:00	14:00	14:45	14:30	9:10	10:50	14:30	14:30
Measuring Point Elev. (ft)	1,067.96	1,067.96	967.43	967.43	967.43	967.43	971.29	971.29	971.29	971.29
Depth to Water (ft)	6.47	6.89	8.29	6.28	9.62	10.02	7.20	6.43	8.10	8.78
Groundwater Elevation (ft)	1,061.49	1,061.07	959.14	961.15	957.81	957.41	964.09	964.86	963.19	962.51
Conductivity (μmho/cm)	112	60	206	200	335	344	220	234	402	390
Dissolved Oxygen (ppm)	8.26	8.75	2.24	4.57	1.01	1.18	5.32	2	1.04	1.45
Oxidation/Reduction (mV)	172	89	111	23	-46	96	80	76	3	54
Temperature (degrees C)	16	15.1	14.8	17.9	18.8	16.1	16	16.6	18.8	16
Turbidity (NTU)	38	16.7	1	1	1	1	1	0	2	1
pH	6.7	6.66	7.4	7.46	7.81	7.6	8.09	7.74	8	7.72
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	.	.	.	.	.	.	.	.
Suspended Solids (mg/L)	.	.	.	.	.	.	.	.	.	.
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.
Major Ions (mg/L)										
Calcium	8.32	8.64	53.8	51.3	50.7	51.2	38.2	42	41.3	42.8
Magnesium	3.41	3.49	8.31	8	8.04	8.34	11.3	11.8	12.3	12.3
Potassium	1.75	2.06	1.56	1.46	1.6	1.73	2.47	2.69	2.93	2.99
Sodium	3.81	4.28	5.67	5.3	5.6	5.61	23.2	19.9	18.9	17.5
Bicarbonate	.	.	.	.	.	.	.	.	.	.
Carbonate	.	.	.	.	.	.	.	.	.	.
Chloride	.	.	.	.	.	.	.	.	.	.
Fluoride	.	.	.	.	.	.	.	.	.	.
Nitrate as N	.	.	.	.	.	.	.	.	.	.
Sulfate	.	.	.	.	.	.	.	.	.	.
Charge balance error (%)	.	.	.	.	.	.	.	.	.	.
Trace Metals (mg/L)										
Aluminum	1.17	0.882	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.0978	0.105	0.243	0.236	0.252	0.272	0.277	0.273	0.278	0.256
Beryllium	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	<	<	<
Cadmium	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	0.0298	0.0202
Iron	0.646	0.389	0.36	0.159	0.138	0.391	0.0926	0.0815	0.14	0.0682
Lead	<	<	<	<	<	<	<	<	<	<
Lithium	0.0122	0.0143	0.0104	0.0104	0.0107	0.0113	0.0254	0.0238	0.0249	0.0245
Manganese	0.0128	0.0076	0.0701	0.0304	0.052	0.0565	0.0072	0.0074	0.0112	0.009
Mercury	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	0.0385	0.043	0.416	0.41	0.431	0.461	1.19	1.18	1.22	1.2
Thallium	<	<	<	<	<	<	<	<	<	<
Uranium	<	<	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-922				GW-923		GW-924			
Functional Area	EMWMF				EMWMF		EMWMF			
Date Sampled	02/20/07	04/17/07	08/08/07	11/06/07	02/28/07*	04/24/07*	02/26/07		04/25/07	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								Dup		Dup
Field Measurements										
Time Sampled	15:45	10:15	11:00	14:20	9:15	9:05	12:00	.	13:45	.
Measuring Point Elev. (ft)	956.91	956.91	956.91	956.91	1,016.73	1,016.73	968.90	.	968.90	.
Depth to Water (ft)	5.33	5.11	5.66	5.70	32.45	30.91	9.18	.	8.75	.
Groundwater Elevation (ft)	951.58	951.80	951.25	951.21	984.28	985.82	959.72	.	960.15	.
Conductivity (μmho/cm)	189	200	338	199	529	289	183	.	199	.
Dissolved Oxygen (ppm)	1.56	5.55	1.28	4.33	7.01	4.32	1.95	.	1.49	.
Oxidation/Reduction (mV)	111	-11	30	24	54	189	165	.	102	.
Temperature (degrees C)	15.7	15.1	18.4	15.5	15.2	18.7	15.9	.	17.3	.
Turbidity (NTU)	1	1	3	1	100	0	1	.	1	.
pH	7.78	7.83	8.06	7.86	7.09	7.21	7.99	.	7.59	.
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	.	.	.	.	.	.	.	.
Suspended Solids (mg/L)	.	.	.	.	.	.	.	.	.	.
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.
Major Ions (mg/L)										
Calcium	62.7	39.7	42.6	45.1	64.5	66.1	53.8	54.7	53.5	55
Magnesium	6.32	8.75	9.93	9.92	11.1	11.3	4.91	4.85	4.66	4.8
Potassium	0.861 Q	2.41	3.04	3.06	1.84	1.68	0.836	0.82	0.803	0.833
Sodium	7.13	7.53	9.24	8.5	9.76	9.78	5.3	5.22	4.96	5.1
Bicarbonate	.	.	.	.	.	.	.	.	.	.
Carbonate	.	.	.	.	.	.	.	.	.	.
Chloride	.	.	.	.	.	.	.	.	.	.
Fluoride	.	.	.	.	.	.	.	.	.	.
Nitrate as N	.	.	.	.	.	.	.	.	.	.
Sulfate	.	.	.	.	.	.	.	.	.	.
Charge balance error (%)	.	.	.	.	.	.	.	.	.	.
Trace Metals (mg/L)										
Aluminum	<	0.697	<	<	2.31	0.813	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.203 Q	0.622	0.692	0.713	0.123	0.0923	0.276	0.284	0.269	0.276
Beryllium	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	<	<	<
Cadmium	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	0.0206	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	0.209	0.742	0.172	0.233	2.37	0.799	0.0614	0.0674	0.0755	0.0931
Lead	<	<	<	<	0.0026	<	<	<	<	<
Lithium	0.0167	0.0128	0.0142	0.0144	0.0187	0.0171	0.0108	0.011	0.0105	0.0108
Manganese	0.0241	0.0256	0.0171	0.0254	0.14	0.0237	0.0323	0.0405	0.0369	0.0365
Mercury	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	0.0111	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	0.107 Q	0.683	0.815	0.783	0.106	0.104	0.103	0.101	0.101	0.104
Thallium	<	<	<	<	<	<	<	<	<	<
Uranium	<	<	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-924				GW-925				GW-926	
Functional Area	EMWMF				EMWMF				EMWMF	
Date Sampled	08/13/07		11/07/07		02/15/07	04/24/07*	08/08/07*	11/07/07*	02/26/07	04/24/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup		Dup						
Field Measurements										
Time Sampled	10:00	.	11:00	.	14:30	14:30	9:00	10:00	14:00	13:30
Measuring Point Elev. (ft)	968.90	.	968.90	.	971.14	971.14	971.14	971.14	968.94	968.94
Depth to Water (ft)	12.47	.	11.35	.	5.26	4.77	5.95	6.52	9.09	7.79
Groundwater Elevation (ft)	956.43	.	957.55	.	965.88	966.37	965.19	964.62	959.85	961.15
Conductivity (μmho/cm)	190	.	193	.	901	674	652	641	342	384
Dissolved Oxygen (ppm)	1.19	.	3.75	.	1.72	1.05	1.22	2.1	2	1.51
Oxidation/Reduction (mV)	-42	.	67	.	137	127	93	61	-20	-5
Temperature (degrees C)	19.5	.	15.8	.	10.8	17.8	19.7	15.5	14.4	18
Turbidity (NTU)	1	.	1	.	6	52	17	4	2	1
pH	7.66	.	7.68	.	9.1	9.47	9.59	9.73	7.5	7.75
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	.	.	.	.	.	.	.	.
Suspended Solids (mg/L)	.	.	.	.	.	.	.	.	.	.
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.
Major Ions (mg/L)										
Calcium	49.7	55.2	54.9	54.5	2.63	2.1	2.83	2.29	39.8	43.7
Magnesium	4.29	4.83	4.89	4.85	1.22	0.888	1.04	1.05	9.85	10.6
Potassium	0.747	0.832	0.838	0.829	2.43	1.98	2.12	2.36	1.89	2.02
Sodium	4.81	5.43	5.39	5.41	130	118	130	146	8.97	9.11
Bicarbonate	.	.	.	.	.	.	.	.	.	.
Carbonate	.	.	.	.	.	.	.	.	.	.
Chloride	.	.	.	.	.	.	.	.	.	.
Fluoride	.	.	.	.	.	.	.	.	.	.
Nitrate as N	.	.	.	.	.	.	.	.	.	.
Sulfate	.	.	.	.	.	.	.	.	.	.
Charge balance error (%)	.	.	.	.	.	.	.	.	.	.
Trace Metals (mg/L)										
Aluminum	<	<	<	<	1.71	0.597	0.515	1.15	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.254	0.28	0.29	0.289	0.17	0.114	0.135	0.133	0.205	0.214
Beryllium	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	<	0.273	0.192	0.207	0.233	<	<
Cadmium	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	0.0238	<	<	<
Iron	<	<	0.0845	0.105	1.16	0.426	0.43	0.396	0.108	0.137
Lead	<	<	<	<	0.0126	<	<	0.0022	<	<
Lithium	0.0102	0.0112	0.0115	0.0113	0.0604	0.0579	0.0641	0.0662	0.0124	0.0129
Manganese	0.031	0.0338	0.0381	0.0388	0.0163	0.0093	0.0157	0.0096	0.0202	0.0227
Mercury	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	0.0149	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	0.0933	0.105	0.0993	0.0985	0.192	0.155	0.179	0.187	0.67	0.68
Thallium	<	<	<	<	<	<	<	<	<	<
Uranium	<	<	<	<	0.0054	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-926		GW-927				BCK-04.55		EMWNT-03A	
Functional Area	EMWMF		EMWMF				EXP-SW		EXP-SW	
Date Sampled	08/13/07	11/12/07	02/21/07	04/18/07	08/13/07	11/05/07	08/01/07		02/20/07	04/16/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP	BJC	BJC
Sample Type								Dup		
Field Measurements										
Time Sampled	13:40	14:15	14:30	10:15	15:40	13:45	8:00	8:00	14:15	11:20
Measuring Point Elev. (ft)	968.94	968.94	997.19	997.19	997.19	997.19	.	.	.	.
Depth to Water (ft)	10.86	12.04	20.01	19.11	21.97	23.17	.	.	.	.
Groundwater Elevation (ft)	958.08	956.90	977.18	978.08	975.22	974.02	.	.	.	.
Conductivity (μmho/cm)	338	201	211	230	222	440	413	413	171	76
Dissolved Oxygen (ppm)	1.16	3.21	1.08	4.45	1.42	1.31	4.16	4.16	10.04	11.08
Oxidation/Reduction (mV)	-38	22	-27	-86	-140	104	124	124	330	162
Temperature (degrees C)	18.1	15.6	17.2	15.2	20.8	15.9	18.5	18.5	7.83	13.13
Turbidity (NTU)	1	1	1	1	1	1	.	.	6.89	21.3
pH	7.73	7.78	7.8	7.57	7.79	7.69	6.9	6.9	7.6	7.24
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	.	.	.	.	222	225	.	.
Suspended Solids (mg/L)	.	.	.	.	.	.	3	11	.	.
Turbidity (NTU)	.	.	.	.	.	.	3.41	3.39	.	.
Major Ions (mg/L)										
Calcium	39.8	43.8	46.4	62	61	61.8	52.5	53	23.7	7.82
Magnesium	9.97	10.9	10.1	6.24	6.18	6.35	16	16.2	4.96	2.45
Potassium	1.97	2.54	2.8 Q	0.807	0.856	0.932	<	<	1.09	1.38
Sodium	8.82	10.3	8.29	7.01	7.38	7.49	5.2	5.21	3.59	1.67
Bicarbonate	.	.	.	.	.	.	173	174	.	.
Carbonate	.	.	.	.	.	.	<	<	.	.
Chloride	.	.	.	.	.	.	7.72	8	.	.
Fluoride	.	.	.	.	.	.	0.106	0.108	.	.
Nitrate as N	.	.	.	.	.	.	1.04	1.07	.	.
Sulfate	.	.	.	.	.	.	12.3	12.2	.	.
Charge balance error (%)	.	.	.	.	.	.	1.8	2	.	.
Trace Metals (mg/L)										
Aluminum	<	0.97 Q	<	<	<	<	0.307	0.437	0.217	0.949
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.197	0.261	0.708 Q	0.201	0.194	0.202	0.0756	0.0763	0.0371	0.0356
Beryllium	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	<	<	<
Cadmium	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	0.221	2.4	0.111	0.214	0.124	0.118	0.255	0.364	0.642	1.04
Lead	<	<	<	<	<	<	0.00244	0.014	<	<
Lithium	0.0121	0.0143	0.0135	0.017	0.017	0.0178	<	0.0108	<	<
Manganese	0.021	0.0524	0.0184	0.03	0.0204	0.0223	0.0735	0.0728	0.224	0.138
Mercury	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<	<
Selenium	.	<	<	<	.	<	<	<	<	<
Strontium	0.65	0.718	0.793 Q	0.107	0.105	0.109	0.0914	0.0909	0.0502	0.0239
Thallium	<	<	<	<	<	<	<	<	<	<
Uranium	<	<	<	<	<	<	0.0183	0.0184	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	EMWNT-03A	EMWNT-05			EMW-VWEIR				EMW-VWUNDER	
Functional Area	EXP-SW	EXP-SW			EXP-SW				EXP-SW	
Date Sampled	11/06/07	02/20/07	04/16/07	11/06/07	02/20/07	04/16/07		11/06/07	02/22/07	04/26/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type							Dup			
Field Measurements										
Time Sampled	10:30	13:20	10:50	10:15	9:40	10:00	.	9:15	13:30	9:50
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.	.	.	.
Conductivity (μmho/cm)	582	231	95	453	689	215	.	297	204	437
Dissolved Oxygen (ppm)	12.39	9.48	11.39	11.04	17.4	10.48	.	10.98	3.41	3.38
Oxidation/Reduction (mV)	88.3	174.5	130.5	17.9	304	241.5	.	107.7	123.6	195
Temperature (degrees C)	11.59	8.63	13.44	11.23	8.84	10.47	.	11.63	16	17.3
Turbidity (NTU)	5.83	1.81	6.92	14.7	3.9	101	.	294	4	4
pH	7.85	7.54	7.3	7.54	7.95	7.29	.	7.93	7.61	7.65
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	.	.	.	.	.	.	.	.
Suspended Solids (mg/L)	.	.	.	.	.	.	.	64	.	.
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.
Major Ions (mg/L)										
Calcium	73.8	27.8	9.46	61.1	91.8 Q	22.2	22.7	26.6	52.5	52.4
Magnesium	14.9	7.29	3.51	16.4	14.9	5.72	5.84	7.11	8.11	8.03
Potassium	1.39	1.27	1.52	4.05	5.44	2.64	2.65	4.07	1.87	1.91
Sodium	3.6	4.93	1.77	5.85	22.9	1.1	1.1	1.44	7.28	7.44
Bicarbonate	.	.	.	.	.	.	.	.	.	.
Carbonate	.	.	.	.	.	.	.	.	.	.
Chloride	.	.	.	.	.	.	.	.	.	.
Fluoride	.	.	.	.	.	.	.	.	.	.
Nitrate as N	.	.	.	.	.	.	.	.	.	.
Sulfate	.	.	.	.	.	.	.	.	.	.
Charge balance error (%)	.	.	.	.	.	.	.	.	.	.
Trace Metals (mg/L)										
Aluminum	<	<	<	0.291	0.423	2.07	1.98	3.5	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.0329	0.0442	0.0316	0.0558	0.0801	0.048	0.0489	0.0758	0.0795	0.0841
Beryllium	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	<	0.203 Q	<	<	<	<	<
Cadmium	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	0.235	1.41	0.459	1.2	0.411	2.92	2.97	4.52	<	<
Lead	0.0028 J	<	<	<	<	0.0029 J	0.0028 J	0.0352	<	<
Lithium	<	<	<	<	0.194 Q	<	<	<	<	<
Manganese	0.0899	0.462	0.114	0.362	0.0326	0.0745	0.076	0.0804	0.0744	0.123
Mercury	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	0.116	0.0724	0.0276	0.123	0.238	0.0493	0.0504	0.0652	0.156	0.162
Thallium	<	<	<	<	<	<	<	<	<	<
Uranium	<	<	<	<	0.0612 Q	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	EMW-VWUNDER		NT-01	NT-04			NT-07	NT-08	
Functional Area	EXP-SW		EXP-SW	EXP-SW			EXP-SW	EXP-SW	
Date Sampled	08/09/07	11/08/07	08/01/07	02/20/07	04/16/07	11/06/07	01/04/07	01/04/07	08/09/07
Program	BJC	BJC	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type									
Field Measurements									
Time Sampled	13:15	10:00	9:50	10:20	10:20	9:50	9:25	9:45	9:00
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.	.	.
Conductivity (μmho/cm)	377	237	3,480	548	429	499	370	301	371
Dissolved Oxygen (ppm)	1.52	7.74	4.12	16	10.02	10.31	11.7	10	6.63
Oxidation/Reduction (mV)	123	119	157	169.1	97.9	102.7	136	120.5	115
Temperature (degrees C)	22.4	14.8	21.7	7.06	9.8	11.13	8.75	7.52	22.68
Turbidity (NTU)	1	1	.	1.45	8.43	20	2.15	8.16	1.17
pH	7.56	6.6	6.6	7.17	6.74	7.38	6.19	6.46	7.61
Miscellaneous Analytes									
Dissolved Solids (mg/L)	.	.	2,440	.	.	.	157	138	236
Suspended Solids (mg/L)	.	.	31	.	.	.	5	<	9
Turbidity (NTU)	.	.	2.47	.	.	.	.	.	.
Major Ions (mg/L)									
Calcium	50.3	53.5	507	92.7	70.8	80.5	54	49.2	62.2
Magnesium	7.83	8.06	71.4	16.3	13.1	16.6	9.03	6	5.68
Potassium	1.74	2.04	9.2	1.77	1.58	2.63	1.92	1.6	2.85
Sodium	7.16	7.45	71.2	7.75	4	6.9	5.65	4.35	5
Bicarbonate	.	.	265	.	.	.	141	123	164
Carbonate	.	.	<	.	.	.	<	<	<
Chloride	.	.	40.8	.	.	.	17.6	8.7	15.1
Fluoride	.	.	1.95	.	.	.	<	0.12	0.34
Nitrate as N	.	.	344	.	.	.	0.044	1.8	<
Sulfate	.	.	45.7	.	.	.	19.6	13.5	5.9
Charge balance error (%)	.	.	3.7	.	.	.	-0.5	0.3	-0.8
Trace Metals (mg/L)									
Aluminum	<	<	0.814	<	<	0.444	<	0.24	<
Arsenic	<	<	<	<	<	<	<	<	<
Barium	0.082	0.0845	1.14	0.365	0.213	0.215	0.0357	0.0686	0.107
Beryllium	<	<	0.000718	<	<	<	<	<	<
Boron	<	<	0.83	<	<	<	0.305	0.531	1.11
Cadmium	<	<	0.0468	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<
Cobalt	<	<	0.0211	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<
Iron	<	<	0.219	1.74	0.992	0.876	0.0628 *	0.427 *	0.321
Lead	<	<	0.00678	<	<	<	<	<	<
Lithium	<	<	0.0493	<	<	<	0.0706	0.1	0.2
Manganese	0.926	0.0113 Q	10.8	0.54	0.518	0.373	0.0108	0.141	0.279
Mercury	<	<	<	<	<	<	.	.	.
Nickel	<	<	0.172	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<
Strontium	0.151	0.158	1.38	0.243	0.176	0.245	0.113	0.108	0.148
Thallium	<	<	<	<	<	<	<	<	<
Uranium	<	<	0.0458	<	<	0.021 Q	0.018	0.17	0.26
Zinc	<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	SS-4	SS-5	SS-6	
Functional Area	EXP-SW	EXP-SW	EXP-SW	
Date Sampled	08/01/07	08/01/07	01/03/07	07/02/07
Program	GWPP	GWPP	BJC	BJC
Sample Type				
Field Measurements				
Time Sampled	9:10	8:45	13:25	8:18
Measuring Point Elev. (ft)	.	.	.	.
Depth to Water (ft)	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.
Conductivity (μmho/cm)	762	550	285	432
Dissolved Oxygen (ppm)	3.07	3.46	10.7	4.97
Oxidation/Reduction (mV)	142	138	88.7	93.7
Temperature (degrees C)	17.5	15.1	14.32	15.64
Turbidity (NTU)	.	.	3.69	6
pH	6.9	6.8	7.86	7.01
Miscellaneous Analytes				
Dissolved Solids (mg/L)	452	284	.	.
Suspended Solids (mg/L)	<	<	.	.
Turbidity (NTU)	1.89	4.52	.	.
Major Ions (mg/L)				
Calcium	103	71.5	36.9	57.8 J
Magnesium	19.2	17.1	14.5	19
Potassium	2.85	2.15	0.66	0.979
Sodium	17.4	8.68	1.88	3.66
Bicarbonate	238	200	.	.
Carbonate	<	<	.	.
Chloride	31.8	15	.	.
Fluoride	0.312	0.166	.	.
Nitrate as N	17.9	6.41	0.38	0.71
Sulfate	26	20.6	.	.
Charge balance error (%)	0.4	0.9	.	.
Trace Metals (mg/L)				
Aluminum	<	0.258	<	<
Arsenic	<	<	<	<
Barium	0.142	0.0955	0.0565	0.0803
Beryllium	<	<	<	<
Boron	0.137	<	<	<
Cadmium	<	<	<	<
Chromium	<	<	<	<
Cobalt	<	<	<	<
Copper	<	<	<	<
Iron	0.163	0.172	0.0722	0.221 J
Lead	<	0.00601	<	<
Lithium	0.0116	<	<	<
Manganese	0.0138	0.0091	0.0262	0.0236 J
Mercury	<	<	.	.
Nickel	<	<	<	<
Selenium	<	<	<	<
Strontium	0.248	0.141	0.0471	0.0972
Thallium	<	<	<	<
Uranium	0.0672	0.0277	<	0.01
Zinc	<	<	<	<

APPENDIX D.2

VOLATILE ORGANIC COMPOUNDS

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-008		GW-014			GW-046		GW-052	GW-053
Functional Area	OLF		BG			BG		BG	BG
Date Sampled	01/02/07	07/02/07	03/26/07	08/07/07		01/03/07	07/02/07	02/12/07	02/13/07
Program	BJC	BJC	GWPP	GWPP	GWPP	BJC	BJC	GWPP	GWPP
Sample Type					Dup				
Chloroethenes (µg/L)									
Tetrachloroethene	40	73	26	40	41	370	420	<	<
Trichloroethene	9	11	200	240	260	730	620	<	2 J
cis-1,2-Dichloroethene	21	23	1,100	1,400	1,400	2,500	1,700	<	11
trans-1,2-Dichloroethene	<	<	3 J	4 J	4 J	15	10	<	<
1,1-Dichloroethene	6	4	65	89	90	46	27	<	<
Vinyl chloride	<	<	170	230	260	240	170	<	<
Chloroethanes (µg/L)									
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	33	19	<	<
1,2-Dichloroethane	<	<	2 J	2 J	2 J	1 J	1 J	<	<
1,1-Dichloroethane	11	13	250	240	250	95	70	<	4 J
Chloroethane	<	<	<	<	<	4 J	2 J	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	130
Chloromethanes (µg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)									
Benzene	<	<	2 J	3 J	3 J	9	9	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	<	<	<	.	.	<	<
Trichlorofluoromethane	.	.	<	<	<	.	.	<	<
Dichlorodifluoromethane	.	.	<	<	<	.	.	<	<
Miscellaneous (µg/L)									
Acetone	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	<	<	<	.	.	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-071			GW-072	GW-077		GW-078		GW-079	
Functional Area	BG			BG	BG		BG		BG	
Date Sampled	03/21/07		08/09/07	03/21/07	03/07/07	07/31/07	03/07/07	07/31/07	03/07/07	07/31/07
Program	GWPP	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup								
Chloroethenes (μg/L)										
Tetrachloroethene	960	1,000	1,300	<	<	<	<	<	<	<
Trichloroethene	89	94	170	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	38	40	50	2 J	<	<	<	<	<	<
trans-1,2-Dichloroethene	2 J	2 J	2 J	<	<	<	<	<	<	<
1,1-Dichloroethene	130	130	170	2 J	<	<	<	<	<	<
Vinyl chloride	5	5	9	<	<	<	<	<	<	<
Chloroethanes (μg/L)										
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	420	460	1,700	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2,700	2,800	4,100	71	<	<	<	<	<	<
Chloroethane	22	20	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (μg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	1 JB	1 BJ	1 JB	1 BJ	1 JB	1 J
Petrol. Hydrocarb. (μg/L)										
Benzene	1,400	1,600	2,200	<	<	<	<	<	<	<
Ethylbenzene	4 J	4 J	4 J	<	<	<	<	<	<	<
Toluene	31	31	46	<	<	<	<	<	<	<
Total Xylene	15	14	15	<	<	<	<	<	<	<
Chlorofluorocarbons (μg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	330	360	720	<	.	.	.	.	.	.
Trichlorofluoromethane	<	<	13	<	.	.	.	.	.	.
Dichlorodifluoromethane	28	27	<	<	.	.	.	.	.	.
Miscellaneous (μg/L)										
Acetone	<	<	<	<	1 J	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	.	.	.	.	.	.
Carbon disulfide	<	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-080				GW-082	GW-085		GW-089		GW-098
Functional Area	BG				BG	OLF		BG		OLF
Date Sampled	03/07/07		07/31/07		02/07/07	03/22/07	08/15/07	02/12/07		04/23/07
Program	BJC	BJC	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type		Dup		Dup					Dup	
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	2 J	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	6
cis-1,2-Dichloroethene	<	<	<	<	670	<	<	<	<	2 J
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	1 J
Vinyl chloride	<	<	<	<	140	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	28	<	<	<	<	<
Chloroethane	<	<	<	<	33	<	<	<	<	<
1,4-Dioxane	.	.	.	.	43	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	1 BJ	1 JB	<	1 BJ	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	1 J	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	<	<	<	<	<	<
Trichlorofluoromethane	.	.	.	.	<	<	<	<	<	<
Dichlorodifluoromethane	.	.	.	.	<	<	<	<	<	<
Miscellaneous (µg/L)										
Acetone	<	2 J	<	<	<	<	<	22 Q	23 Q	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	.	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-100		GW-101	GW-122	GW-127	GW-225		GW-226		GW-229
Functional Area	S3		S3	S3	S3	OLF		OLF		OLF
Date Sampled	05/07/07		05/09/07	05/09/07	05/07/07	03/20/07	08/13/07	03/20/07	08/13/07	04/23/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type		Dup								
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	2 J	1 J	<	2 J	<
Trichloroethene	<	<	<	<	<	290	240	82	180	7 J
cis-1,2-Dichloroethene	<	<	<	<	<	3 J	3 J	8	3 J	330
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	3 J	3 J	<	2 J	30
Vinyl chloride	<	<	<	<	<	<	<	<	<	25
Chloroethanes (µg/L)										
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	6
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	7 J
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	4 J	2 J	<	3 J	<
Chloroform	<	<	<	<	<	2 J	2 J	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	10 J
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	<	<	<	<	<	<	37
Trichlorofluoromethane	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
Acetone	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	1 J	<	14
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	<	3 J
Carbon disulfide	<	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-236	GW-246		GW-257	GW-276		GW-277	GW-289	GW-307
Functional Area	S3	S3		BG	S3		S3	BG	RS
Date Sampled	05/03/07	03/22/07	08/15/07	02/08/07	01/03/07	07/09/07	05/14/07	02/08/07	05/01/07
Program	GWPP	GWPP	GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP
Sample Type									
Chloroethenes (µg/L)									
Tetrachloroethene	<	120	93	240	5	4	15	980	<
Trichloroethene	<	2 J	1 J	<	<	<	<	19	13
cis-1,2-Dichloroethene	<	1 J	1 J	<	<	<	<	3 J	3 J
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	3 J	3 J	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)									
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	1 J
Chloroethane	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	37	29	<	<	<	3 J	<	<
Methylene chloride	<	16	15	<	<	<	4 J	<	<
Petrol. Hydrocarb. (µg/L)									
Benzene	<	1 J	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	<	61	42	<	.	.	6	<	<
Trichlorofluoromethane	<	<	<	<	.	.	<	<	<
Dichlorodifluoromethane	<	<	<	<	.	.	<	<	<
Miscellaneous (µg/L)									
Acetone	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	.	.	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-313		GW-315	GW-363				GW-368	GW-369	GW-537
Functional Area	SPI		SPI	EMWMF				OLF	OLF	OLF
Date Sampled	05/01/07		05/01/07	02/28/07	04/26/07	08/15/07	11/14/07	04/26/07	04/30/07	05/03/07
Program	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	GWPP	GWPP	GWPP
Sample Type		Dup								
Chloroethenes (µg/L)										
Tetrachloroethene	6	6	7	<	<	<	<	<	<	<
Trichloroethene	2 J	2 J	2 J	<	<	<	<	45	46	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	.	.	.	.	<	<	<
1,1-Dichloroethene	<	<	<	.	.	.	.	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,2-Trichloroethane	<	<	<	.	.	.	.	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	.	.	.	.	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	2 J
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	0.5 Q	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	.	.	.	.	<	<	<
Trichlorofluoromethane	<	<	<	.	.	.	.	<	<	<
Dichlorodifluoromethane	<	<	<	.	.	.	.	<	<	<
Miscellaneous (µg/L)										
Acetone	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	.	.	.	.	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-601	GW-615	GW-616	GW-626		GW-627		GW-629	
Functional Area	OLF	S3	S3	BG		BG		BG	
Date Sampled	04/24/07	05/14/07	05/10/07	03/19/07	08/02/07	03/19/07	08/06/07	01/09/07	08/06/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type									
Chloroethenes (μg/L)									
Tetrachloroethene	<	<	<	630	250	1,100	1,000	17,000	15,000
Trichloroethene	85	<	<	480	170	370	340	4,500	4,400
cis-1,2-Dichloroethene	<	<	<	6,600	1,800	32	29	60	57
trans-1,2-Dichloroethene	<	<	<	11	3 J	3 J	3 J	69	68
1,1-Dichloroethene	<	<	<	85	27	38	35	320	300
Vinyl chloride	<	<	<	1,400	250	43	42	32	29
Chloroethanes (μg/L)									
1,1,2-Trichloroethane	<	<	<	1 J	<	<	<	6	6
1,1,1-Trichloroethane	<	<	<	20	7	<	<	79	64
1,2-Dichloroethane	<	<	<	21	7	<	<	4 J	4 J
1,1-Dichloroethane	<	<	<	230	77	120	110	1,300	1,500
Chloroethane	<	<	<	<	<	2 J	2 J	<	4 J
1,4-Dioxane	.	.	.	.	.	.	.	.	.
Chloromethanes (μg/L)									
Carbon tetrachloride	1 J	<	<	<	<	<	<	<	<
Chloroform	<	<	<	72	23	<	<	<	<
Methylene chloride	<	6	<	<	<	<	<	<	<
Petrol. Hydrocarb. (μg/L)									
Benzene	<	<	<	170	32	<	<	7	5
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	7	6
Total Xylene	<	<	<	<	<	<	<	4 J	4 J
Chlorofluorocarbons (μg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	200	57	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	19	5	<	<	<	<
Miscellaneous (μg/L)									
Acetone	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	2 J	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-639				GW-653	GW-683		GW-684	
Functional Area	EMWMF				BG	EXP-A		EXP-A	
Date Sampled	02/14/07	04/19/07	08/14/07	11/15/07	02/07/07	03/07/07	08/01/07	03/07/07	07/26/07
Program	BJC	BJC	BJC	BJC	GWPP	BJC	BJC	BJC	BJC
Sample Type									
Chloroethenes (µg/L)									
Tetrachloroethene	<	<	<	<	5 J	<	<	<	<
Trichloroethene	0.4 J	<	<	<	3 J	<	<	<	0.1 J
cis-1,2-Dichloroethene	<	<	<	<	47	1 J	<	1 J	0.3 J
trans-1,2-Dichloroethene	.	.	.	.	<	<	<	<	<
1,1-Dichloroethene	.	.	.	.	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)									
1,1,2-Trichloroethane	.	.	.	.	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	.	.	.	.	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	3 J	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	<	.	.	.	.
Chloromethanes (µg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	2 JB	<	1 JB	<
Petrol. Hydrocarb. (µg/L)									
Benzene	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	<	.	.	.	.
Trichlorofluoromethane	.	.	.	.	<	.	.	.	.
Dichlorodifluoromethane	.	.	.	.	<	.	.	.	.
Miscellaneous (µg/L)									
Acetone	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	.	<	.	.	.	.
Carbon disulfide	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-694		GW-703	GW-704		GW-706		GW-712	
Functional Area	EXP-B		EXP-B	EXP-B		EXP-B		EXP-W	
Date Sampled	08/16/07		08/16/07	03/08/07	08/01/07	03/08/07	08/01/07	01/02/07	07/02/07
Program	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup							
Chloroethenes (µg/L)									
Tetrachloroethene	<	<	<	<	<	<	<	<	<
Trichloroethene	2 J	2 J	9	18	19	7	10	<	<
cis-1,2-Dichloroethene	<	<	5	5 J	<	11	16	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	2 J	1	<	2	<	<
Vinyl chloride	<	<	<	<	<	<	0.1 J	<	<
Chloroethanes (µg/L)									
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)									
Benzene	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	.	.	.	.	.	.
Trichlorofluoromethane	<	<	<	.	.	.	.	.	.
Dichlorodifluoromethane	<	<	<	.	.	.	.	.	.
Miscellaneous (µg/L)									
Acetone	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	.	.	.	.	.	.
Carbon disulfide	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-713				GW-714		GW-724	GW-725	GW-738	GW-740
Functional Area	EXP-W				EXP-W		EXP-C	EXP-C	EXP-C	EXP-C
Date Sampled	01/02/07		07/03/07		01/02/07	07/02/07	08/20/07	08/20/07	08/21/07	08/21/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP	GWPP	GWPP
Sample Type		Dup		Dup						
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	3 J	3 J	<	<
Trichloroethene	<	<	<	<	<	<	88	7	16	44
cis-1,2-Dichloroethene	<	<	<	<	<	<	3 J	1 J	<	2 J
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	<	<	<	<
Trichlorofluoromethane	.	.	.	.	.	.	<	<	<	<
Dichlorodifluoromethane	.	.	.	.	.	.	<	<	<	<
Miscellaneous (µg/L)										
Acetone	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	.	.	.	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-916				GW-917				GW-918	
Functional Area	EMWMF				EMWMF				EMWMF	
Date Sampled	02/27/07	04/24/07	08/14/07	11/07/07	02/22/07	04/18/07	08/09/07	11/05/07	02/27/07	04/16/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	.	.	.	.	.	.	.	.	.	.
1,1-Dichloroethene	.	.	.	.	.	.	.	.	.	.
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,2-Trichloroethane	.	.	.	.	.	.	.	.	.	.
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	.	.	.	.	.	.	.	.	.	.
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.	.	.
Trichlorofluoromethane	.	.	.	.	.	.	.	.	.	.
Dichlorodifluoromethane	.	.	.	.	.	.	.	.	.	.
Miscellaneous (µg/L)										
Acetone	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	.	.	.	.	.	.	.
Carbon disulfide	<	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-918		GW-920				GW-921			
Functional Area	EMWMF		EMWMF				EMWMF			
Date Sampled	08/14/07	11/06/07	02/20/07	04/17/07	08/08/07	11/14/07	02/27/07	04/23/07	08/07/07	11/06/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type										
Chloroethenes (μg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	.	.	.	.	.	.	.	.	.	.
1,1-Dichloroethene	.	.	.	.	.	.	.	.	.	.
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (μg/L)										
1,1,2-Trichloroethane	.	.	.	.	.	.	.	.	.	.
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	.	.	.	.	.	.	.	.	.	.
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (μg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (μg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	0.2 J	<	<	<	<	0.1 Q	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (μg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.	.	.
Trichlorofluoromethane	.	.	.	.	.	.	.	.	.	.
Dichlorodifluoromethane	.	.	.	.	.	.	.	.	.	.
Miscellaneous (μg/L)										
Acetone	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	.	.	.	.	.	.	.
Carbon disulfide	<	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-922				GW-923		GW-924			
Functional Area	EMWMF				EMWMF		EMWMF			
Date Sampled	02/20/07	04/17/07	08/08/07	11/06/07	02/28/07	04/24/07	02/26/07		04/25/07	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								Dup		Dup
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	1 Q	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	.	.	.	.	.	.	.	.	.	.
1,1-Dichloroethene	.	.	.	.	.	.	.	.	.	.
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,2-Trichloroethane	.	.	.	.	.	.	.	.	.	.
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	.	.	.	.	.	.	.	.	.	.
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	0.1 J	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.	.	.
Trichlorofluoromethane	.	.	.	.	.	.	.	.	.	.
Dichlorodifluoromethane	.	.	.	.	.	.	.	.	.	.
Miscellaneous (µg/L)										
Acetone	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	.	.	.	.	.	.	.
Carbon disulfide	<	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-924				GW-925				GW-926	
Functional Area	EMWMF				EMWMF				EMWMF	
Date Sampled	08/13/07		11/07/07		02/15/07	04/24/07	08/08/07	11/07/07	02/26/07	04/24/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup		Dup						
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	0.2 J	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	.	.	.	.	.	.	.	.	.	.
1,1-Dichloroethene	.	.	.	.	.	.	.	.	.	.
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,2-Trichloroethane	.	.	.	.	.	.	.	.	.	.
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	.	.	.	.	.	.	.	.	.	.
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	0.3 J	0.2 J	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.	.	.
Trichlorofluoromethane	.	.	.	.	.	.	.	.	.	.
Dichlorodifluoromethane	.	.	.	.	.	.	.	.	.	.
Miscellaneous (µg/L)										
Acetone	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	.	.	.	.	.	.	.
Carbon disulfide	<	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-926		GW-927				BCK-04.55	
Functional Area	EMWMF		EMWMF				EXP-SW	
Date Sampled	08/13/07	11/12/07	02/21/07	04/18/07	08/13/07	11/05/07	08/01/07	
Program	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP
Sample Type								Dup
Chloroethenes (µg/L)								
Tetrachloroethene	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	.	.	.	.	.	.	<	<
1,1-Dichloroethene	.	.	.	.	.	.	<	<
Vinyl chloride	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)								
1,1,2-Trichloroethane	.	.	.	.	.	.	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<
1,2-Dichloroethane	.	.	.	.	.	.	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)								
Carbon tetrachloride	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)								
Benzene	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	0.1 J	<	<	<
Total Xylene	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)								
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	<	<
Trichlorofluoromethane	.	.	.	.	.	.	<	<
Dichlorodifluoromethane	.	.	.	.	.	.	<	<
Miscellaneous (µg/L)								
Acetone	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	.	.	.	<	<
Carbon disulfide	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	EMWNT-03A			EMWNT-05			EMW-VWEIR		
Functional Area	EXP-SW			EXP-SW			EXP-SW		
Date Sampled	02/20/07	04/16/07	11/06/07	02/20/07	04/16/07	11/06/07	02/20/07	04/16/07	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type									Dup
Chloroethenes (μg/L)									
Tetrachloroethene	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	.	.	<	.	.	<	.	.
1,1-Dichloroethene	<	.	.	<	.	.	<	.	.
Vinyl chloride	<	<	<	<	<	<	<	<	<
Chloroethanes (μg/L)									
1,1,2-Trichloroethane	<	.	.	<	.	.	<	.	.
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	.	.	<	.	.	<	.	.
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.
Chloromethanes (μg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (μg/L)									
Benzene	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (μg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.	.
Trichlorofluoromethane	.	.	.	.	.	.	.	.	.
Dichlorodifluoromethane	.	.	.	.	.	.	.	.	.
Miscellaneous (μg/L)									
Acetone	<	<	3 J	2 J	<	3 J	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	.	.	.	.	.	.
Carbon disulfide	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	EMW-VWEIR	EMW-VWUNDER				NT-01	NT-04		
Functional Area	EXP-SW	EXP-SW				EXP-SW	EXP-SW		
Date Sampled	11/06/07	02/22/07	04/26/07	08/09/07	11/08/07	08/01/07	02/20/07	04/16/07	11/06/07
Program	BJC	BJC	BJC	BJC	BJC	GWPP	BJC	BJC	BJC
Sample Type									
Chloroethenes (µg/L)									
Tetrachloroethene	<	<	<	<	<	43	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	1 J	5	7	<
trans-1,2-Dichloroethene	.	.	.	.	.	<	.	.	.
1,1-Dichloroethene	.	.	.	.	.	<	.	.	.
Vinyl chloride	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)									
1,1,2-Trichloroethane	.	.	.	.	.	<	.	.	.
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	.	.	.	.	.	<	.	.	.
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	1 J	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)									
Benzene	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<
Chlorofluorocarbons (µg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	<	.	.	.
Trichlorofluoromethane	.	.	.	.	.	<	.	.	.
Dichlorodifluoromethane	.	.	.	.	.	<	.	.	.
Miscellaneous (µg/L)									
Acetone	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	.	.	<	.	.	.
Carbon disulfide	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	NT-07	NT-08		SS-4	SS-5	SS-6	
Functional Area	EXP-SW	EXP-SW		EXP-SW	EXP-SW	EXP-SW	
Date Sampled	01/04/07	01/04/07	08/09/07	08/01/07	08/01/07	01/03/07	07/02/07
Program	BJC	BJC	BJC	GWPP	GWPP	BJC	BJC
Sample Type							
Chloroethenes (μg/L)							
Tetrachloroethene	23	11	<	<	<	<	<
Trichloroethene	16	7	<	7	<	<	<
cis-1,2-Dichloroethene	74	63	<	10	2 J	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<
1,1-Dichloroethene	5 J	<	<	1 J	<	<	<
Vinyl chloride	3 J	2 J	<	<	<	<	<
Chloroethanes (μg/L)							
1,1,2-Trichloroethane	<	<	<	<	<	<	<
1,1,1-Trichloroethane	2 J	1 J	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<
1,1-Dichloroethane	11	5	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.
Chloromethanes (μg/L)							
Carbon tetrachloride	<	<	<	<	<	<	<
Chloroform	1 J	<	<	<	<	<	<
Methylene chloride	2 JB	2 JB	<	<	<	<	<
Petrol. Hydrocarb. (μg/L)							
Benzene	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<
Chlorofluorocarbons (μg/L)							
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	<	<	.	.
Trichlorofluoromethane	.	.	.	<	<	.	.
Dichlorodifluoromethane	.	.	.	<	<	.	.
Miscellaneous (μg/L)							
Acetone	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	<	<	.	.
Carbon disulfide	<	<	<	<	<	<	<

APPENDIX D.3

RADIOLOGICAL ANALYTES

APPENDIX D.3: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Functional Area	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	TPU	MDA	Activity	TPU	MDA
GW-008	OLF	01/02/07	BJC	<	.	2.07	<	.	3.32
GW-008	OLF	07/02/07	BJC	<	.	2.05	<	.	3.61
GW-014	BG	03/26/07	GWPP	<	.	2.8	<	.	6.7
GW-014	BG	08/07/07	GWPP	15 Q	7.9	4.5	20	8.8	15
GW-014 Dup	BG	08/07/07	GWPP	24 Q	10	12	<	.	21
GW-046	BG	01/03/07	BJC	<	.	2.02	<	.	3.95
GW-046	BG	07/02/07	BJC	<	.	1.85	<	.	3.65
GW-052	BG	02/12/07	GWPP	26	5.1	2.5	17	4.5	6.7
GW-053	BG	02/13/07	GWPP	5.5	4.1	3	<	.	7.2
GW-071	BG	03/21/07	GWPP	<	.	4.5	<	.	12
GW-071 Dup	BG	03/21/07	GWPP	<	.	5.3	<	.	17
GW-071	BG	08/09/07	GWPP	<	.	15	<	.	21
GW-072	BG	03/21/07	GWPP	<	.	4	10	3.7	6.1
GW-082	BG	02/07/07	GWPP	2.8 R	3.5	2.2	<	.	5.4
GW-085	OLF	03/22/07	GWPP	<	.	3.3	57	6.8	6.9
GW-085	OLF	08/15/07	GWPP	<	.	7	41	9.8	13
GW-089	BG	02/12/07	GWPP	2.6 R	3	2.3	<	.	5.6
GW-089 Dup	BG	02/12/07	GWPP	<	.	2.8	<	.	6.6
GW-098	OLF	04/23/07	GWPP	<	.	6.6	<	.	16
GW-100	S3	05/07/07	GWPP	<	.	8.2	<	.	29
GW-100 Dup	S3	05/07/07	GWPP	<	.	11	<	.	21
GW-101	S3	05/09/07	GWPP	<	.	6	<	.	12
GW-122	S3	05/09/07	GWPP	<	.	12	<	.	34
GW-127	S3	05/07/07	GWPP	26 Q	8.5	5	20	6.9	10
GW-225	OLF	03/20/07	GWPP	6.5	6	2.4	20	4.7	6.2
GW-225	OLF	08/13/07	GWPP	12	9.5	11	20	9.1	16
GW-226	OLF	03/20/07	GWPP	8.7	6.5	2.6	<	.	7.5
GW-226	OLF	08/13/07	GWPP	<	.	13	31	9	14
GW-229	OLF	04/23/07	GWPP	79	14	4.3	61	11	16
GW-236	S3	05/03/07	GWPP	8.8	4.5	3	36	5	5
GW-246	S3	03/22/07	GWPP	670	110	46	19,000	440	110
GW-246	S3	08/15/07	GWPP	140	110	110	16,000	580	240
GW-257	BG	02/08/07	GWPP	2.2 R	2.9	2.2	<	.	5.9
GW-276	S3	01/03/07	BJC	120	20.6	2.65	151	24.9	5.42
GW-276	S3	07/09/07	BJC	109	19.1	2.26	218	35.5	4.79
GW-277	S3	05/14/07	GWPP	<	.	22	580	62	66
GW-289	BG	02/08/07	GWPP	3.3	3	2.2	<	.	6.1
GW-307	RS	05/01/07	GWPP	3.2 R	6	3.2	11	5.2	8.5
GW-313	SPI	05/01/07	GWPP	<	.	3.6	<	.	6.5
GW-313 Dup	SPI	05/01/07	GWPP	5.3	4.3	3.1	<	.	6.1
GW-315	SPI	05/01/07	GWPP	<	.	4.1	16	4.2	6.6
GW-368	OLF	04/26/07	GWPP	6.6	3.8	2.1	8.7	3.9	7
GW-369	OLF	04/30/07	GWPP	2.8 R	3.7	2.8	15	3.9	5.9
GW-537	OLF	05/03/07	GWPP	<	.	12	330	24	23
GW-601	OLF	04/24/07	GWPP	4.8 R	6.5	4	15	5.6	9.1
GW-615	S3	05/14/07	GWPP	<	.	190	630	330	590
GW-616	S3	05/10/07	GWPP	9.8 R	10	6	<	.	28
GW-626	BG	03/19/07	GWPP	2.1 R	3.1	1.9	<	.	4.6
GW-626	BG	08/02/07	GWPP	<	.	5.5	<	.	7.3

APPENDIX D.3: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Functional Area	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	TPU	MDA	Activity	TPU	MDA
GW-627	BG	03/19/07	GWPP	<	.	4.5	<	.	9.2
GW-627	BG	08/06/07	GWPP	<	.	11	<	.	15
GW-629	BG	01/09/07	GWPP	<	.	3.3	<	.	8.2
GW-629	BG	08/06/07	GWPP	18 Q	10	7.2	<	.	17
GW-653	BG	02/07/07	GWPP	<	.	2.1	<	.	5.3
GW-683	EXP-A	03/07/07	BJC	9.15	2.67	1.8	18.1	3.92	3.67
GW-683	EXP-A	08/01/07	BJC	7.5	2.16	1.56	11.6	2.79	3.22
GW-684	EXP-A	03/07/07	BJC	9.63	2.79	1.73	23.1	4.7	3.77
GW-684	EXP-A	07/26/07	BJC	8.3	2.14	1.85	18.3	3.9	4.08
GW-694	EXP-B	08/16/07	GWPP	22	5.1	4.1	28	5.6	7.3
GW-694 Dup	EXP-B	08/16/07	GWPP	15	4.5	2.8	24	5.7	8.5
GW-703	EXP-B	08/16/07	GWPP	<	.	6.7	42	7.2	10
GW-704	EXP-B	03/08/07	BJC	4.6	1.91	1.95	31.6	5.9	3.58
GW-704	EXP-B	08/01/07	BJC	<	.	1.83	14.5	3.43	3.64
GW-706	EXP-B	03/08/07	BJC	20.5	5.3	2.77	75.2	13	4.36
GW-706	EXP-B	08/01/07	BJC	15.4	3.94	3.22	43.8	8.04	5.15
GW-712	EXP-W	01/02/07	BJC	<	.	2.08	<	.	3.68
GW-712	EXP-W	07/02/07	BJC	<	.	1.96	<	.	3.63
GW-713	EXP-W	01/02/07	BJC	<	.	2.34	<	.	3.92
GW-713 Dup	EXP-W	01/02/07	BJC	<	.	2	<	.	3.55
GW-713	EXP-W	07/03/07	BJC	<	.	1.45	3.72	1.6	2.87
GW-713 Dup	EXP-W	07/03/07	BJC	<	.	2.08	<	.	3.6
GW-714	EXP-W	01/02/07	BJC	<	.	2.05	<	.	3.9
GW-714	EXP-W	07/02/07	BJC	<	.	1.95	<	.	3.83
GW-724	EXP-C	08/20/07	GWPP	<	.	9.7	18	4.7	6.8
GW-725	EXP-C	08/20/07	GWPP	<	.	7.9	14	6.2	11
GW-738	EXP-C	08/21/07	GWPP	<	.	7.3	65	8.8	9.3
GW-740	EXP-C	08/21/07	GWPP	<	.	5	<	.	7.3
BCK-04.55	EXP-SW	08/01/07	GWPP	14	5	3.2	<	.	8.6
BCK-04.55 Dup	EXP-SW	08/01/07	GWPP	6.5	4.3	2.5	13	4.7	7.4
EMWNT-03A	EXP-SW	02/20/07	BJC	<	.	2.25	<	.	3.42
EMWNT-05	EXP-SW	02/20/07	BJC	<	.	1.91	<	.	3.5
NT-01	EXP-SW	08/01/07	GWPP	<	.	4.1	130	9.8	8
SS-4	EXP-SW	08/01/07	GWPP	9.9	5.4	6	31	6.6	10
SS-5	EXP-SW	08/01/07	GWPP	16	8.2	9.9	54	7.7	11
SS-6	EXP-SW	01/03/07	BJC	<	.	1.78	3.64	1.9	3.59
SS-6	EXP-SW	07/02/07	BJC	4.77	2.27	2.37	6.33	2.38	3.91

Sampling Point	GW-046						GW-246					
Functional Area	BG						S3					
Date Sampled	01/03/07			07/02/07			03/22/07			08/15/07		
Program	BJC			BJC			GWPP			GWPP		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	<MDA	.	2.02	<MDA	.	1.85	670	110	46	140	110	110
Gross Beta	<MDA	.	3.95	<MDA	.	3.65	19,000	440	110	16,000	580	240
Americium-241	.	.	.	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.	.	.	.
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.	.	.	.
Technetium-99	<MDA	.	6.15	<MDA	.	6.95	25,000	83	13	23,000	81	13
Uranium-234	.	.	.	<MDA	.	0.476	76	7.5	0.46	81	8.1	0.44
Uranium-235	<MDA	.	0.143	.	.	.	4.4	0.8	0.23	5.5	0.95	0.3
Uranium-236	.	.	.	.	.	.	2	0.45	0.16	2.2	0.5	0.16
Uranium-238	<MDA	.	0.223	<MDA	.	0.445	190	18	0.37	190	18	0.38

Sampling Point	GW-276						GW-277			GW-363		
Functional Area	S3						S3			EMWMF		
Date Sampled	01/03/07			07/09/07			05/14/07			02/28/07		
Program	BJC			BJC			GWPP			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	120	20.6	2.65	109	19.1	2.26	<MDA	.	22	.	.	.
Gross Beta	151	24.9	5.42	218	35.5	4.79	580	62	66	.	.	.
Americium-241	<MDA	.	0.123	0.0427	0.0388	0.0232	.	.	.	<MDA	.	0.11
Neptunium-237	6.77	2.72	0.108	4.6	1.84	0.0663	.	.	.	<MDA	.	0.19
Total Radium Alpha	1.24	0.593	0.408	0.177	0.101	0.132	.	.	.	.	.	.
Strontium-89/90	1.4	0.659	0.913	2.41	1.31	2.38	.	.	.	<MDA	.	1.56
Technetium-99	233	38.5	6.47	282	46.1	6.09	840	19	15	4.43	1.04	3.31
Uranium-234	.	.	.	49.2	9.15	0.544	7.9 Q	1.2	0.64	0.18	0.05	0.04
Uranium-235	3.2	1.16	0.216	.	.	.	0.52	0.28	0.22	<MDA	.	0.11
Uranium-236	.	.	.	.	.	.	0.25	0.17	0.22	.	.	.
Uranium-238	118	21.9	0.293	107	18.7	0.489	23 Q	2.7	0.47	0.14	0.04	0.04

Sampling Point	GW-363									GW-615		
Functional Area	EMWMF									S3		
Date Sampled	04/26/07			08/15/07			11/14/07			05/14/07		
Program	BJC			BJC			BJC			GWPP		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	<MDA	.	190
Gross Beta	.	.	.	.	.	.	.	.	.	630	330	590
Americium-241	0.1	0.06	0	<MDA	.	0.11	<MDA	.	0.13	.	.	.
Neptunium-237	0.05	0.03	0	<MDA	.	0.08	<MDA	.	0.09	.	.	.
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1	<MDA	.	1.52	<MDA	.	1.84	.	.	.
Technetium-99	<MDA	.	3	<MDA	.	3.38	<MDA	.	3.07	91	10	15
Uranium-234	0.18	0.05	0	<MDA	.	0.13	0.14	0.1	0.09	160	15	0.56
Uranium-235	0.04	0.03	0	<MDA	.	0.18	<MDA	.	0.11	9.9	1.4	0.22
Uranium-236	.	.	.	.	.	.	.	.	.	3	0.59	0.17
Uranium-238	< CE	0.02	0	0.14	0.05	0.09	0.08	0.07	0.07	420	40	0.48

Sampling Point	GW-639											
Functional Area	EMWMF											
Date Sampled	02/14/07			04/19/07			08/14/07			11/15/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.07	< CE	0.07	0	<MDA	.	0.14	<MDA	.	0.09
Neptunium-237	0.11	0.04	0.07	<MDA	.	0	<MDA	.	0.09	<MDA	.	0.07
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.7	<MDA	.	1	<MDA	.	1.67	<MDA	.	1.87
Technetium-99	<MDA	.	3.32	<MDA	.	3	<MDA	.	3.38	<MDA	.	3.07
Uranium-234	0.51	0.09	0.09	0.47	0.09	0	0.46	0.09	0.11	0.45	0.17	0.08
Uranium-235	<MDA	.	0.14	0.04	0.04	0	<MDA	.	0.19	<MDA	.	0.08
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.13	0.07	0.05	0	0.19	0.06	0.09	<MDA	.	0.08

Sampling Point	GW-683						GW-684					
Functional Area	EXP-A						EXP-A					
Date Sampled	03/07/07			08/01/07			03/07/07			07/26/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	9.15	2.67	1.8	7.5	2.16	1.56	9.63	2.79	1.73	8.3	2.14	1.85
Gross Beta	18.1	3.92	3.67	11.6	2.79	3.22	23.1	4.7	3.77	18.3	3.9	4.08
Americium-241	.	.	.	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.	.	.	.
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.	.	.	.
Technetium-99	18.9	5.51	6.46	10.8	5.05	7.27	13.2	4.78	6.32	12.3	5.1	7.09
Uranium-234	3.5	1.1	0.422	4.63	1.27	0.442	5.26	1.46	0.368	4.53	1.22	0.513
Uranium-235	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	7.41	1.82	0.297	5.7	1.45	0.298	8.23	1.99	0.181	6.38	1.53	0.452

Sampling Point	GW-704						GW-706					
Functional Area	EXP-B						EXP-B					
Date Sampled	03/08/07			08/01/07			03/08/07			08/01/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	4.6	1.91	1.95	<MDA	.	1.83	20.5	5.3	2.77	15.4	3.94	3.22
Gross Beta	31.6	5.9	3.58	14.5	3.43	3.64	75.2	13	4.36	43.8	8.04	5.15
Americium-241	.	.	.	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.	.	.	.
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.	.	.	.
Technetium-99	48	9.4	6.14	<MDA	.	6.5	86.2	15.3	6.27	90.1	16.5	8.16
Uranium-234	3.28	0.695	0.08	0.7	0.373	0.325	12.1	2.12	0.126	12.6	2.89	0.575
Uranium-235	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	4.45	0.886	0.133	<MDA	.	0.325	22.3	3.74	0.0805	20.4	4.21	0.509

APPENDIX D.3: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotopic Analyses

Sampling Point	GW-712						GW-713					
Functional Area	EXP-W						EXP-W					
Date Sampled	01/02/07			07/02/07			01/02/07					
Program	BJC			BJC			BJC					
Sample Type										Dup		
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	<MDA	.	2.08	<MDA	.	1.96	<MDA	.	2.34	<MDA	.	2
Gross Beta	<MDA	.	3.68	<MDA	.	3.63	<MDA	.	3.92	<MDA	.	3.55
Americium-241	.	.	.	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.	.	.	.
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.	.	.	.
Technetium-99	<MDA	.	6.18	<MDA	.	6.16	<MDA	.	6.01	<MDA	.	6.12
Uranium-234	<MDA	.	0.59	<MDA	.	0.953	<MDA	.	0.373	<MDA	.	0.478
Uranium-235	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.376	<MDA	.	0.797	<MDA	.	0.373	<MDA	.	0.182

Sampling Point	GW-713						GW-714					
Functional Area	EXP-W						EXP-W					
Date Sampled	07/03/07						01/02/07			07/02/07		
Program	BJC						BJC			BJC		
Sample Type				Dup								
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	<MDA	.	1.45	<MDA	.	2.08	<MDA	.	2.05	<MDA	.	1.95
Gross Beta	3.72	1.6	2.87	<MDA	.	3.6	<MDA	.	3.9	<MDA	.	3.83
Americium-241	.	.	.	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.	.	.	.
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.	.	.	.
Technetium-99	<MDA	.	6.25	<MDA	.	5.98	<MDA	.	6.28	<MDA	.	6.58
Uranium-234	0.814	0.511	0.435	<MDA	.	0.504	0.888	0.53	0.482	1.79	0.96	0.732
Uranium-235	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.193	0.441	0.379	0.355	0.666	0.443	0.317	<MDA	.	0.83

Sampling Point	GW-916											
Functional Area	EMWMF											
Date Sampled	02/27/07			04/24/07			08/14/07			11/07/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.12	0.12	0.09	0	<MDA	.	0.14	<MDA	.	0.14
Neptunium-237	<MDA	.	0.14	0.23	0.06	0	<MDA	.	0.07	<MDA	.	0.07
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	1.67	0.41	1.53	<MDA	.	1	<MDA	.	1.74	<MDA	.	1.95
Technetium-99	<MDA	.	3.31	<MDA	.	3	<MDA	.	3.38	<MDA	.	3.13
Uranium-234	0.14	0.04	0.07	0.1	0.05	0	<MDA	.	0.13	0.12	0.09	0.08
Uranium-235	<MDA	.	0.11	<MDA	.	0	<MDA	.	0.11	<MDA	.	0.08
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	0.09	0.04	0.09	0.04	0.03	0	<MDA	.	0.07	0.08	0.07	0.08

Sampling Point	GW-917											
Functional Area	EMWMF											
Date Sampled	02/22/07			04/18/07			08/09/07			11/05/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.15	< CE	0.06	0	<MDA	.	0.08	<MDA	.	0.12
Neptunium-237	0.78	0.11	0.1	< CE	0.02	0	<MDA	.	0.1	<MDA	.	0.09
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.53	<MDA	.	1	<MDA	.	1.76	<MDA	.	1.83
Technetium-99	<MDA	.	3.31	<MDA	.	3	<MDA	.	3.38	<MDA	.	3.08
Uranium-234	0.14	0.04	0.04	0.1	0.04	0	<MDA	.	0.1	0.1	0.08	0.1
Uranium-235	<MDA	.	0.08	< CE	0.03	0	<MDA	.	0.11	0.08	0.07	0.08
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.07	0.05	0.03	0	<MDA	.	0.1	<MDA	.	0.11

Sampling Point	GW-918											
Functional Area	EMWMF											
Date Sampled	02/27/07			04/16/07			08/14/07			11/06/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.12	<MDA	.	0	<MDA	.	0.13	0.17	0.14	0.04
Neptunium-237	<MDA	.	0.12	<MDA	.	0	<MDA	.	0.04	<MDA	.	0.1
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.32	<MDA	.	1	<MDA	.	1.83	<MDA	.	1.67
Technetium-99	4.44	1.04	3.32	<MDA	.	3	<MDA	.	3.38	<MDA	.	3.11
Uranium-234	0.13	0.04	0.08	0.14	0.04	0	0.12	0.05	0.12	<MDA	.	0.11
Uranium-235	<MDA	.	0.12	0.07	0.03	0	<MDA	.	0.12	<MDA	.	0.15
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.04	0.04	0.03	0	<MDA	.	0.1	<MDA	.	0.09

Sampling Point	GW-920											
Functional Area	EMWMF											
Date Sampled	02/20/07			04/17/07			08/08/07			11/14/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	0.19	0.1	0.12	< CE	0.04	0	0.14	0.07	0.04	<MDA	.	0.09
Neptunium-237	<MDA	.	0.12	0.08	0.04	0	<MDA	.	0.09	<MDA	.	0.08
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.3	<MDA	.	1	<MDA	.	1.21	<MDA	.	1.72
Technetium-99	<MDA	.	3.31	<MDA	.	3	<MDA	.	3.38	<MDA	.	3.07
Uranium-234	0.32	0.07	0.09	0.28	0.06	0	0.24	0.06	0.09	0.12	0.09	0.11
Uranium-235	0.2	0.06	0.11	< CE	0.02	0	0.13	0.05	0.13	<MDA	.	0.21
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	0.2	0.05	0.04	0.08	0.03	0	0.11	0.04	0.08	<MDA	.	0.14

Sampling Point	GW-921											
Functional Area	EMWMF											
Date Sampled	02/27/07			04/23/07			08/07/07			11/06/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.12	<MDA	.	0	0.19	0.07	0.04	<MDA	.	0.04
Neptunium-237	<MDA	.	0.14	0.05	0.03	0	<MDA	.	0.12	<MDA	.	0.09
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.68	<MDA	.	1	<MDA	.	1.35	<MDA	.	1.8
Technetium-99	<MDA	.	3.31	<MDA	.	3	<MDA	.	3.38	<MDA	.	3.08
Uranium-234	0.12	0.05	0.11	0.13	0.05	0	<MDA	.	0.09	0.13	0.09	0.09
Uranium-235	0.08	0.04	0.08	< CE	0.03	0	<MDA	.	0.11	<MDA	.	0.11
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	0.07	0.03	0.07	0.04	0.03	0	0.11	0.04	0.04	<MDA	.	0.1

Sampling Point	GW-922											
Functional Area	EMWMF											
Date Sampled	02/20/07			04/17/07			08/08/07			11/06/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.12	<MDA	.	0	<MDA	.	0.09	<MDA	.	0.13
Neptunium-237	<MDA	.	0.11	< CE	0.02	0	<MDA	.	0.09	<MDA	.	0.08
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.45	<MDA	.	1	<MDA	.	1.61	<MDA	.	1.65
Technetium-99	<MDA	.	3.32	<MDA	.	3	<MDA	.	3.38	<MDA	.	3.07
Uranium-234	<MDA	.	0.13	0.1	0.05	0	0.13	0.04	0.1	0.26	0.13	0.09
Uranium-235	<MDA	.	0.17	0.06	0.04	0	<MDA	.	0.14	<MDA	.	0.14
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.13	0.05	0.03	0	0.12	0.04	0.08	<MDA	.	0.09

Sampling Point	GW-923						GW-924					
Functional Area	EMWMF						EMWMF					
Date Sampled	02/27/07			04/26/07			02/26/07					
Program	BJC			BJC			BJC					
Sample Type										Dup		
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.14	0.06	0.05	0	<MDA	.	0.1	<MDA	.	0.14
Neptunium-237	<MDA	.	0.1	< CE	0.02	0	<MDA	.	0.08	<MDA	.	0.14
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.39	<MDA	.	1	<MDA	.	1.69	<MDA	.	1.52
Technetium-99	3.35	1.03	3.34	<MDA	.	3	<MDA	.	3.32	<MDA	.	3.31
Uranium-234	0.47	0.09	0.08	0.35	0.07	0	0.23	0.06	0.08	0.16	0.05	0.08
Uranium-235	0.1	0.04	0.08	0.03	0.02	0	<MDA	.	0.11	0.09	0.04	0.08
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	0.39	0.08	0.07	0.17	0.05	0	0.09	0.03	0.04	0.08	0.04	0.08

Sampling Point	GW-924											
Functional Area	EMWMF											
Date Sampled	04/25/07						08/13/07					
Program	BJC						BJC					
Sample Type				Dup						Dup		
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	0.13	0.08	0	0.25	0.11	0	0.04	0.04	0.04	<MDA	.	0.08
Neptunium-237	0.1	0.04	0	0.03	0.02	0	<MDA	.	0.13	<MDA	.	0.11
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1	<MDA	.	1	<MDA	.	1.21	<MDA	.	1.87
Technetium-99	<MDA	.	3	<MDA	.	3	<MDA	.	3.38	<MDA	.	3.38
Uranium-234	0.11	0.05	0	0.24	0.06	0	<MDA	.	0.11	0.15	0.05	0.09
Uranium-235	< CE	0.03	0	0.04	0.03	0	<MDA	.	0.18	<MDA	.	0.11
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0	0.15	0.05	0	<MDA	.	0.12	<MDA	.	0.08

Sampling Point	GW-924						GW-925					
Functional Area	EMWMF						EMWMF					
Date Sampled	11/07/07						02/16/07			04/25/07		
Program	BJC						BJC			BJC		
Sample Type				Dup								
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.12	<MDA	.	0.14	0.14	0.05	0.07	0.07	0.07	0
Neptunium-237	<MDA	.	0.1	<MDA	.	0.08	<MDA	.	0.04	0.03	0.02	0
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.82	<MDA	.	1.71	<MDA	.	1.78	<MDA	.	1
Technetium-99	<MDA	.	3.07	<MDA	.	3.07	<MDA	.	3.37	<MDA	.	3
Uranium-234	<MDA	.	0.12	0.21	0.13	0.09	2.08	0.22	0.16	0.46	0.09	0
Uranium-235	<MDA	.	0.11	<MDA	.	0.15	0.15	0.05	0.13	<MDA	.	0
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.07	<MDA	.	0.1	1.01	0.14	0.12	0.21	0.06	0

Sampling Point	GW-925						GW-926					
Functional Area	EMWMF						EMWMF					
Date Sampled	08/08/07			11/07/07			02/26/07			04/24/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.07	<MDA	.	0.12	<MDA	.	0.11	0.21	0.08	0
Neptunium-237	<MDA	.	0.15	<MDA	.	0.07	<MDA	.	0.17	<MDA	.	0
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.55	<MDA	.	1.93	<MDA	.	1.38	<MDA	.	1
Technetium-99	<MDA	.	3.39	<MDA	.	3.13	<MDA	.	3.31	<MDA	.	3
Uranium-234	0.57	0.09	0.07	0.51	0.18	0.09	0.21	0.06	0.1	0.05	0.04	0
Uranium-235	0.14	0.05	0.11	0.14	0.1	0.13	0.09	0.04	0.08	< CE	0.03	0
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	0.3	0.07	0.09	0.31	0.14	0.08	<MDA	.	0.07	0.11	0.04	0

APPENDIX D.3: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotopic Analyses

Sampling Point	GW-926						GW-927					
Functional Area	EMWMF						EMWMF					
Date Sampled	08/13/07			11/12/07			02/21/07			04/18/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.11	<MDA	.	0.09	<MDA	.	0.13	<MDA	.	0
Neptunium-237	<MDA	.	0.11	<MDA	.	0.08	<MDA	.	0.1	0.06	0.03	0
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.68	<MDA	.	1.54	<MDA	.	1.61	<MDA	.	1
Technetium-99	<MDA	.	3.38	<MDA	.	3.13	<MDA	.	3.32	<MDA	.	3
Uranium-234	0.17	0.06	0.14	0.13	0.09	0.04	0.12	0.04	0.07	0.08	0.04	0
Uranium-235	<MDA	.	0.19	<MDA	.	0.11	<MDA	.	0.08	<MDA	.	0
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.13	<MDA	.	0.1	0.12	0.04	0.04	0.08	0.03	0

Sampling Point	GW-927						EMW-VWEIR					
Functional Area	EMWMF						EXP-SW					
Date Sampled	08/13/07			11/05/07			02/20/07			04/16/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.13	<MDA	.	0.11	<MDA	.	0.13	0.1	0.08	0
Neptunium-237	<MDA	.	0.07	<MDA	.	0.11	0.12	0.05	0.1	0.2	0.07	0
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.55	<MDA	.	1.57	497	9.41	1.93	5.47	0.32	1
Technetium-99	<MDA	.	3.38	<MDA	.	3.07	29.5	1.26	2.87	<MDA	.	5
Uranium-234	0.13	0.05	0.1	0.28	0.13	0.11	34.2	2.97	0.45	1.09	0.29	0
Uranium-235	<MDA	.	0.16	<MDA	.	0.11	1.95	0.43	0.52	0.16	0.11	0
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.11	<MDA	.	0.08	20.4	1.92	0.36	0.58	0.21	0

Sampling Point	EMW-VWEIR						EMW-VWUNDER					
Functional Area	EXP-SW						EXP-SW					
Date Sampled	04/16/07			11/06/07			02/22/07			04/26/07		
Program	BJC			BJC			BJC			BJC		
Sample Type	Dup											
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	< CE	0.07	0	<MDA	.	0.16	0.12	0.07	0.12	< CE	0.04	0
Neptunium-237	< CE	0.03	0	<MDA	.	0.09	<MDA	.	0.1	0.02	0.02	0
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	5.61	0.36	1	21	0.79	2	<MDA	.	1.47	<MDA	.	1
Technetium-99	<MDA	.	5	<MDA	.	5.87	<MDA	.	3.32	<MDA	.	3
Uranium-234	0.83	0.24	0	3.09	0.56	0.3	0.17	0.05	0.12	0.15	0.05	0
Uranium-235	0.11	0.11	0	<MDA	.	0.43	<MDA	.	0.14	0.03	0.02	0
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	0.45	0.17	0	1.31	0.35	0.35	0.14	0.05	0.1	0.12	0.04	0

Sampling Point	EMW-VWUNDER						EMWNT-03A					
Functional Area	EXP-SW						EXP-SW					
Date Sampled	08/09/07			11/08/07			02/20/07			04/16/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	<MDA	.	2.25	.	.	.
Gross Beta	.	.	.	.	.	.	<MDA	.	3.42	.	.	.
Americium-241	0.14	0.06	0.04	<MDA	.	0.11	<MDA	.	0.15	0.12	0.1	0
Neptunium-237	<MDA	.	0.14	<MDA	.	0.1	<MDA	.	0.25	0.06	0.04	0
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.33	<MDA	.	1.97	1.76	0.35	1.49	<MDA	.	1
Technetium-99	<MDA	.	3.38	<MDA	.	3.07	<MDA	.	5.87	<MDA	.	5
Uranium-234	0.18	0.05	0.11	0.1	0.08	0.09	0.44	0.17	0.27	< CE	0.09	0
Uranium-235	<MDA	.	0.13	<MDA	.	0.1	<MDA	.	0.4	0.12	0.11	0
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	0.14	0.05	0.14	0.07	0.07	0.07	<MDA	.	0.27	0.17	0.11	0

Sampling Point	EMWNT-03A			EMWNT-05								
Functional Area	EXP-SW			EXP-SW								
Date Sampled	11/06/07			02/20/07			04/16/07			11/06/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	<MDA	.	1.91	.	.	.	.	.	.
Gross Beta	.	.	.	<MDA	.	3.5	.	.	.	.	.	.
Americium-241	<MDA	.	0.17	<MDA	.	0.16	< CE	0.1	0	<MDA	.	0.2
Neptunium-237	<MDA	.	0.15	<MDA	.	0.18	0.07	0.05	0	<MDA	.	0.13
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	2.24	<MDA	.	1.4	<MDA	.	1	<MDA	.	2.29
Technetium-99	<MDA	.	5.34	<MDA	.	5.84	<MDA	.	5	<MDA	.	5.35
Uranium-234	1.65	0.34	0.3	<MDA	.	0.27	0.27	0.13	0	0.44	0.18	0.34
Uranium-235	<MDA	.	0.49	<MDA	.	0.5	< CE	0.07	0	<MDA	.	0.43
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	0.6	0.2	0.3	<MDA	.	0.23	0.08	0.08	0	0.46	0.18	0.3

Sampling Point	NT-04									NT-07		
Functional Area	EXP-SW									EXP-SW		
Date Sampled	02/20/07			04/16/07			11/06/07			01/04/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.07	< CE	0.22	0	<MDA	.	0.18	.	.	.
Neptunium-237	<MDA	.	0.15	0	0	0	<MDA	.	0.12	.	.	.
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	3.19	0.33	1.43	<MDA	.	1	<MDA	.	1.96	.	.	.
Technetium-99	<MDA	.	2.81	<MDA	.	5	<MDA	.	5.34	.	.	.
Uranium-234	0.82	0.17	0.14	0.71	0.21	0	6.35	0.81	0.3	3.27	1.05	0.439
Uranium-235	<MDA	.	0.22	0.24	0.13	0	<MDA	.	0.45	.	.	.
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	0.88	0.17	0.11	1.47	0.31	0	8.63	1	0.26	4.49	1.27	0.289

APPENDIX D.3: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotopic Analyses

Sampling Point	NT-08						SS-6					
Functional Area	EXP-SW						EXP-SW					
Date Sampled	01/04/07			08/09/07			01/03/07			07/02/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	.	.	.	<MDA	.	1.78	4.77	2.27	2.37
Gross Beta	.	.	.	.	.	.	3.64	1.9	3.59	6.33	2.38	3.91
Americium-241	.	.	.	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.	.	.	.
Total Radium Alpha	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.	.	.	.
Technetium-99	.	.	.	.	.	.	<MDA	.	6.24	<MDA	.	6.63
Uranium-234	9.91	2.26	0.433	25.1	4.29	0.265	.	.	.	0.743	0.546	0.628
Uranium-235	.	.	.	.	.	.	<MDA	.	0.131	.	.	.
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	48.6	8.57	0.491	80.5	12.8	0.265	0.932	0.422	0.204	<MDA	.	0.661

APPENDIX D.3: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Additional Isotopic Analyses at EMWMF: Detected Results

Sampling Point	Date Sampled	Isotope	Result (pCi/L)		
			Activity	TPU	MDA
GW-363	02/28/07	Americium-243	0.28 J	0.08	0.09
GW-363	04/26/07	Americium-243	0.75	0.16	0
GW-363	08/15/07	Americium-243	0.13 J	0.05	0.08
GW-363	11/14/07	Americium-243	1.22	0.4	0.08
GW-363	02/28/07	Curium-245	0.42 J	0.1	0.11
GW-363	04/26/07	Curium-245	0.8	0.17	0
GW-363	08/15/07	Curium-245	0.23	0.07	0.11
GW-363	11/14/07	Curium-245	1.45	0.44	0.08
GW-363	02/28/07	Curium-246	0.42 J	0.1	0.11
GW-363	04/26/07	Curium-246	0.8	0.17	0
GW-363	08/15/07	Curium-246	0.23	0.07	0.11
GW-363	11/14/07	Curium-246	1.45	0.44	0.08
GW-363	08/15/07	Plutonium-242	0.18	0.08	0.08
GW-363	11/14/07	Radium-228	0.86	0.43	0.7
GW-363	02/28/07	Thorium-232	0.14	0.06	0.1
GW-363	02/28/07	Uranium-232	1.4	0.69	0.04
GW-639	08/14/07	Curium-245	0.31	0.1	0.1
GW-639	08/14/07	Curium-246	0.31	0.1	0.1
GW-639	02/14/07	Curium-247	0.11	0.05	0.04
GW-639	11/15/07	Curium-247	0.26 J	0.23	0.08
GW-639	02/14/07	Curium-248	0.14	0.05	0.07
GW-639	04/19/07	Iodine-129	2.56	0.47	2
GW-639	02/14/07	Plutonium-242	0.12 J	0.04	0.1
GW-639	02/14/07	Radium-226	0.16	0.06	0.06
GW-639	04/19/07	Radium-226	0.12 J	0.04	0
GW-639	11/15/07	Tritium	562 J	70.97	228
GW-639	04/19/07	Uranium-232	0.06	0.03	0
GW-916	04/24/07	Americium-243	0.24	0.09	0
GW-916	08/14/07	Americium-243	0.13 J	0.06	0.1
GW-916	11/07/07	Americium-243	0.18	0.13	0.07
GW-916	04/24/07	Curium-245	0.24	0.1	0
GW-916	08/14/07	Curium-245	0.34	0.1	0.12
GW-916	11/07/07	Curium-245	0.26	0.17	0.09
GW-916	04/24/07	Curium-246	0.24	0.1	0
GW-916	08/14/07	Curium-246	0.34	0.1	0.12
GW-916	11/07/07	Curium-246	0.26	0.17	0.09
GW-916	04/24/07	Iodine-129	1.92	0.42	1
GW-916	02/27/07	Radium-226	0.17	0.07	0.06
GW-916	04/24/07	Radium-226	0.27	0.06	0
GW-916	08/14/07	Radium-226	0.28	0.08	0.06
GW-916	08/14/07	Radium-228	0.7 J	0.12	0.69
GW-916	02/27/07	Thorium-230	0.23 J	0.07	0.08
GW-916	11/07/07	Tritium	576 J	71.54	235
GW-916	02/27/07	Yttrium-90	1.67	0.41	1.53
GW-917	08/09/07	Actinium-227	0.24 J	0.06	0.13
GW-917	11/05/07	Curium-247	0.46 J	0.33	0.09
GW-917	02/22/07	Plutonium-242	0.13 J	0.05	0.09
GW-917	08/09/07	Potassium-40	68.8 Q	30.19	59
GW-917	08/09/07	Radium-226	0.13	0.06	0.05
GW-917	11/05/07	Radium-228	0.47	0.28	0.45
GW-917	08/09/07	Thorium-227	0.24 J	0.06	0.13
GW-917	04/18/07	Thorium-228	0.11 J	0.04	0
GW-917	11/05/07	Thorium-229	0.17 Q	0.14	0.05
GW-917	08/09/07	Tritium	315	73.5	236

APPENDIX D.3: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Additional Isotopic Analyses at EMWMF: Detected Results

Sampling Point	Date Sampled	Isotope	Result (pCi/L) Activity	TPU	MDA
GW-918	04/16/07	Americium-243	0.2	0.07	0
GW-918	04/16/07	Curium-245	0.28	0.09	0
GW-918	04/16/07	Curium-246	0.28	0.09	0
GW-918	08/14/07	Plutonium-236	0.09 Q	0.04	0.04
GW-918	04/16/07	Radium-226	0.13 J	0.04	0
GW-918	08/14/07	Radium-226	0.14	0.06	0.07
GW-920	02/20/07	Americium-243	0.4 J	0.1	0.07
GW-920	08/08/07	Curium-242	0.14	0.07	0.07
GW-920	02/20/07	Curium-245	0.67	0.13	0.09
GW-920	08/08/07	Curium-245	0.17 J	0.09	0.1
GW-920	11/14/07	Curium-245	0.27	0.21	0.15
GW-920	02/20/07	Curium-246	0.67	0.13	0.09
GW-920	08/08/07	Curium-246	0.17 J	0.09	0.1
GW-920	11/14/07	Curium-246	0.27	0.21	0.15
GW-920	02/20/07	Curium-247	0.25	0.09	0.08
GW-920	02/20/07	Curium-248	0.17	0.07	0.07
GW-920	02/20/07	Iodine-129	3.37 J	0.67	2.79
GW-920	02/20/07	Radium-226	0.2	0.07	0.07
GW-920	04/17/07	Radium-226	0.12 J	0.04	0
GW-920	02/20/07	Radium-228	0.57	0.16	0.49
GW-920	02/20/07	Thorium-230	0.27 J	0.08	0.11
GW-920	02/20/07	Thorium-232	0.12	0.05	0.09
GW-920	04/17/07	Uranium-232	0.26	0.12	0
GW-921	02/27/07	Americium-243	0.35 J	0.1	0.07
GW-921	02/27/07	Curium-245	0.68	0.14	0.11
GW-921	08/07/07	Curium-245	0.17 J	0.07	0.04
GW-921	02/27/07	Curium-246	0.68	0.14	0.11
GW-921	08/07/07	Curium-246	0.17 J	0.07	0.04
GW-921	02/27/07	Curium-247	0.15	0.08	0.09
GW-921	02/27/07	Curium-248	0.2	0.07	0.04
GW-921	02/27/07	Plutonium-239/240	0.16	0.06	0.04
GW-921	02/27/07	Radium-226	0.16	0.07	0.07
GW-921	04/23/07	Radium-226	0.12 J	0.05	0
GW-921	08/07/07	Radium-226	0.28	0.09	0.07
GW-921	11/06/07	Radium-228	1.56 Q	0.35	0.51
GW-921	02/27/07	Uranium-232	0.36	0.14	0.04
GW-921	04/23/07	Uranium-232	0.05	0.03	0
GW-922	04/17/07	Americium-243	0.13	0.06	0
GW-922	04/17/07	Curium-245	0.18	0.07	0
GW-922	11/06/07	Curium-245	0.18	0.15	0.08
GW-922	04/17/07	Curium-246	0.18	0.07	0
GW-922	11/06/07	Curium-246	0.18	0.15	0.08
GW-922	02/20/07	Curium-247	0.09	0.05	0.04
GW-922	02/20/07	Iodine-129	3.81 J	0.63	2.56
GW-922	02/20/07	Radium-226	0.12 J	0.06	0.07
GW-922	04/17/07	Radium-226	0.18	0.05	0
GW-922	08/08/07	Radium-226	0.12	0.06	0.06
GW-922	08/08/07	Radium-228	1.18	0.13	0.67
GW-922	02/20/07	Thorium-228	0.15	0.07	0.13
GW-922	04/17/07	Thorium-228	0.18	0.06	0
GW-922	02/20/07	Thorium-229	0.24	0.12	0.06
GW-922	02/20/07	Thorium-230	0.24 J	0.07	0.1

APPENDIX D.3: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Additional Isotopic Analyses at EMWMF: Detected Results

Sampling Point	Date Sampled	Isotope	Result (pCi/L)		
			Activity	TPU	MDA
GW-923	02/27/07	Actinium-227	0.18 J	0.07	0.1
GW-923	04/26/07	Actinium-227	0.2 J	0.06	0
GW-923	02/27/07	Plutonium-238	0.19	0.08	0.09
GW-923	02/27/07	Plutonium-239/240	0.3	0.1	0.08
GW-923	02/27/07	Radium-226	0.57	0.16	0.1
GW-923	04/26/07	Radium-226	0.15 J	0.05	0
GW-923	02/27/07	Thorium-227	0.18 J	0.07	0.1
GW-923	04/26/07	Thorium-227	0.2 J	0.06	0
GW-923	02/27/07	Thorium-230	0.26 J	0.09	0.13
GW-923	02/27/07	Thorium-232	0.21	0.08	0.12
GW-924	02/26/07	Actinium-227	0.21 J	0.07	0.07
GW-924	08/13/07	Actinium-227	0.15 J	0.06	0.13
GW-924 D	08/13/07	Americium-243	0.13 Q	0.06	0.1
GW-924 D	11/07/07	Americium-243	0.18	0.16	0.08
GW-924 D	08/13/07	Curium-242	0.13	0.06	0.07
GW-924	04/25/07	Curium-243/244	0.62	0.15	0
GW-924 D	08/13/07	Curium-245	0.16 J	0.08	0.14
GW-924 D	11/07/07	Curium-245	0.31	0.22	0.09
GW-924 D	08/13/07	Curium-246	0.16 J	0.08	0.14
GW-924 D	11/07/07	Curium-246	0.31	0.22	0.09
GW-924	04/25/07	Curium-247	0.32	0.13	0
GW-924 D	04/25/07	Curium-247	0.13	0.07	0
GW-924 D	11/07/07	Curium-247	0.3 J	0.23	0.04
GW-924 D	11/07/07	Plutonium-236	0.34 Q	0.19	0.11
GW-924	04/25/07	Plutonium-238	0.14	0.06	0
GW-924 D	11/07/07	Plutonium-238	0.21	0.15	0.11
GW-924	04/25/07	Plutonium-239/240	0.22	0.07	0
GW-924	11/07/07	Plutonium-239/240	0.12	0.11	0.07
GW-924	08/13/07	Plutonium-242	0.12	0.06	0.05
GW-924	04/25/07	Radium-226	0.14 J	0.04	0
GW-924 D	04/25/07	Radium-226	0.14 J	0.04	0
GW-924	08/13/07	Radium-226	0.1	0.05	0.06
GW-924	02/26/07	Radium-228	0.66	0.15	0.48
GW-924 D	02/26/07	Radium-228	0.55	0.14	0.43
GW-924 D	04/25/07	Radium-228	0.65	0.13	0
GW-924	11/07/07	Radium-228	0.55	0.28	0.45
GW-924 D	11/07/07	Radium-228	0.49	0.28	0.46
GW-924	02/26/07	Thorium-227	0.21 J	0.07	0.07
GW-924	08/13/07	Thorium-227	0.15 J	0.06	0.13
GW-924	02/26/07	Thorium-229	0.08	0.03	0.05
GW-924 D	08/13/07	Thorium-232	0.14 J	0.06	0.11
GW-924	08/13/07	Tritium	315	73.37	235
GW-924 D	08/13/07	Uranium-232	0.23	0.12	0.04
GW-925	04/25/07	Americium-243	0.31	0.1	0
GW-925	04/25/07	Curium-245	0.34	0.11	0
GW-925	08/08/07	Curium-245	0.18 J	0.09	0.13
GW-925	11/07/07	Curium-245	0.18	0.14	0.1
GW-925	04/25/07	Curium-246	0.34	0.11	0
GW-925	08/08/07	Curium-246	0.18 J	0.09	0.13
GW-925	11/07/07	Curium-246	0.18	0.14	0.1
GW-925	04/25/07	Curium-247	0.3	0.12	0
GW-925	11/07/07	Iodine-129	2.55	0.51	2.1

APPENDIX D.3: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Additional Isotopic Analyses at EMWMF: Detected Results

Sampling Point	Date Sampled	Isotope	Result (pCi/L) Activity	TPU	MDA
GW-925	02/16/07	Plutonium-238	0.21	0.07	0.1
GW-925	02/16/07	Plutonium-239/240	0.23	0.07	0.04
GW-925	02/16/07	Plutonium-242	0.1 J	0.04	0.08
GW-925	08/08/07	Plutonium-242	0.14	0.06	0.04
GW-925	02/16/07	Radium-226	0.35	0.14	0.13
GW-925	04/25/07	Radium-226	0.08 J	0.04	0
GW-925	08/08/07	Radium-226	0.28	0.09	0.07
GW-925	02/16/07	Radium-228	0.74	0.17	0.52
GW-925	11/07/07	Radium-228	0.65	0.31	0.5
GW-925	02/16/07	Thorium-228	0.62	0.12	0.12
GW-925	04/25/07	Thorium-228	0.17	0.08	0
GW-925	11/07/07	Thorium-228	0.36	0.18	0.14
GW-925	02/16/07	Thorium-230	0.3 J	0.08	0.12
GW-925	02/16/07	Thorium-232	0.42	0.1	0.1
GW-925	08/08/07	Thorium-232	0.32	0.08	0.11
GW-925	11/07/07	Thorium-232	0.24	0.14	0.11
GW-926	08/13/07	Americium-243	0.33 Q	0.08	0.1
GW-926	11/12/07	Americium-243	0.31	0.18	0.09
GW-926	02/26/07	Cesium-137	5.55 J	2.43	4.98
GW-926	04/24/07	Curium-243/244	0.22	0.09	0
GW-926	08/13/07	Curium-245	0.44 Q	0.1	0.12
GW-926	11/12/07	Curium-245	0.46	0.24	0.12
GW-926	08/13/07	Curium-246	0.44 Q	0.1	0.12
GW-926	11/12/07	Curium-246	0.46	0.24	0.12
GW-926	04/24/07	Plutonium-239/240	0.14	0.06	0
GW-926	02/26/07	Radium-226	0.24	0.08	0.07
GW-926	04/24/07	Radium-226	0.14 J	0.04	0
GW-926	08/13/07	Radium-228	0.82	0.13	0.7
GW-926	11/12/07	Radium-228	0.97	0.43	0.68
GW-926	02/26/07	Thorium-228	0.21	0.08	0.13
GW-926	02/26/07	Thorium-229	0.22	0.1	0.06
GW-926	02/26/07	Thorium-232	0.15	0.06	0.12
GW-927	08/13/07	Americium-243	0.15 J	0.06	0.04
GW-927	08/13/07	Curium-245	0.16 Q	0.07	0.08
GW-927	08/13/07	Curium-246	0.16 Q	0.07	0.08
GW-927	04/18/07	Plutonium-236	0.31	0.09	0
GW-927	02/21/07	Plutonium-242	0.11 J	0.05	0.08
GW-927	02/21/07	Radium-226	0.16	0.06	0.08
GW-927	04/18/07	Radium-226	0.1 J	0.04	0
GW-927	08/13/07	Radium-226	0.18	0.06	0.04
GW-927	02/21/07	Thorium-230	0.23 J	0.08	0.08
GW-927	08/13/07	Thorium-232	0.13 J	0.05	0.1
EMW-VWEIR	02/20/07	Carbon-14	15.3 J	4.42	14.2
EMW-VWEIR	02/20/07	Chlorine-36	17	1.84	3.53
EMW-VWEIR	02/20/07	Curium-243/244	0.15	0.06	0.09
EMW-VWEIR	02/20/07	Plutonium-236	0.34	0.1	0.13
EMW-VWEIR	02/20/07	Plutonium-241	15.1 J	4.15	13.4
EMW-VWEIR	02/20/07	Plutonium-242	0.21	0.07	0.1
EMW-VWEIR	04/16/07	Plutonium-242	0.12 J	0.06	0
EMW-VWEIR	02/20/07	Radium-226	0.29 J	0.1	0.08
EMW-VWEIR	04/16/07	Radium-226	1.06 J	0.37	0
EMW-VWEIR	11/06/07	Radium-226	0.57	0.22	0.19

APPENDIX D.3: CY 2007 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Additional Isotopic Analyses at EMWMF: Detected Results

Sampling Point	Date Sampled	Isotope	Result (pCi/L) Activity	TPU	MDA
EMW-VWEIR	04/16/07	Thorium-228	0.32	0.14	0
EMW-VWEIR	11/06/07	Thorium-228	0.27	0.1	0.2
EMW-VWEIR D	04/16/07	Thorium-229	0.1	0.05	0
EMW-VWEIR	02/20/07	Thorium-230	0.2	0.07	0.09
EMW-VWEIR	04/16/07	Thorium-230	0.36 J	0.13	0
EMW-VWEIR D	04/16/07	Thorium-230	0.22 J	0.09	0
EMW-VWEIR	11/06/07	Thorium-230	0.29 J	0.1	0.17
EMW-VWEIR	11/06/07	Thorium-232	0.16	0.07	0.13
EMW-VWEIR	02/20/07	Yttrium-90	497 Q	9.41	1.93
EMW-VWEIR	04/16/07	Yttrium-90	5.47	0.32	1
EMW-VWEIR D	04/16/07	Yttrium-90	5.61	0.36	1
EMW-VWEIR	11/06/07	Yttrium-90	21	0.79	2
EMW-VWUNDER	08/09/07	Actinium-227	0.15 J	0.05	0.12
EMW-VWUNDER	02/22/07	Curium-247	0.13	0.06	0.07
EMW-VWUNDER	02/22/07	Curium-248	0.11	0.05	0.07
EMW-VWUNDER	04/26/07	Curium-248	0.15	0.07	0
EMW-VWUNDER	04/26/07	Iodine-129	2.5	0.6	2
EMW-VWUNDER	02/22/07	Plutonium-236	0.42	0.12	0.11
EMW-VWUNDER	04/26/07	Plutonium-239/240	0.22	0.11	0
EMW-VWUNDER	02/22/07	Radium-226	0.3	0.09	0.09
EMW-VWUNDER	08/09/07	Radium-226	0.09	0.04	0.06
EMW-VWUNDER	08/09/07	Thorium-227	0.15 J	0.05	0.12
EMW-VWUNDER	08/09/07	Thorium-229	4.42 Q	1.49	0.08
EMWNT-03A	02/20/07	Curium-245	0.15 J	0.07	0.12
EMWNT-03A	02/20/07	Curium-246	0.15 J	0.07	0.12
EMWNT-03A	02/20/07	Plutonium-239/240	0.19	0.08	0.11
EMWNT-03A	11/06/07	Potassium-40	43.8	17.63	42.5
EMWNT-03A	04/16/07	Thorium-228	0.2	0.1	0
EMWNT-03A	02/20/07	Yttrium-90	1.76	0.35	1.49
EMWNT-05	11/06/07	Iodine-129	1.9	0.4	1.81
EMWNT-05	11/06/07	Potassium-40	68.8 Q	20.81	42.5
NT-04	04/16/07	Plutonium-242	0.27	0.09	0
NT-04	02/20/07	Radium-226	0.3 J	0.11	0.09
NT-04	11/06/07	Thorium-230	0.25 J	0.1	0.17
NT-04	02/20/07	Yttrium-90	3.19	0.33	1.43

APPENDIX E

CY 2007 MONITORING DATA FOR THE
UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME

EXPLANATION

Sampling Point:

200A6	-	Surface water location in storm drain near the outfall to Upper East Fork Poplar Creek
GHK	-	Gum Hollow Branch Kilometer (surface water sampling location)
GW	-	Groundwater monitoring well (also locations that are hyphenated numbers [e.g., 55-3A])
NPR	-	North of Pine Ridge near the Scarboro Community (surface water sampling location)
SCR	-	Spring sampling location in Union Valley
SP	-	Spring sampling location in the Y-12 Complex
STATION	-	Surface water sampling location in Upper East Fork Poplar Creek

Location:

B4	-	Beta-4 Security Pits
B8110	-	Building 81-10
B9201-2	-	Building 9201-2
B9201-5	-	Building 9201-5
CPT	-	Coal Pile Trench
EXP-E	-	Exit Pathway Picket E
EXP-I	-	Exit Pathway Picket I
EXP-J	-	Exit Pathway Picket J
EXP-SR	-	Along Scarboro Road in the gap through Pine Ridge
EXP-SW	-	Surface water or spring sampling station
EXP-UV	-	East of the Oak Ridge Reservation boundary in Union Valley
FF	-	Fuel Facility (Building 9754-2)
FTF	-	Fire Training Facility
GRID	-	Comprehensive Groundwater Monitoring Plan Grid Location
NHP	-	New Hope Pond
RG	-	Rust Garage Area
S2	-	S-2 Site
S3	-	S-3 Site
SY	-	Y-12 Salvage Yard
T0134	-	Tank 0134-U
T2331	-	Tank 2331-U
UOV	-	Uranium Oxide Vault
WCPA	-	Waste Coolant Processing Area
Y-12	-	Y-12 Complex

Monitoring Program:

BJC	-	managed by Bechtel Jacobs Company LLC
GWPP	-	managed by the Y-12 Groundwater Protection Program

Sample Type:

Dup	-	Field Duplicate Sample

EXPLANATION (continued)

Units:

ft	-	feet (elevations are above mean sea level and depths are below grade)
µg/L	-	micrograms per liter
mg/L	-	milligrams per liter
mV	-	millivolts
µmho/cm	-	micromhos per centimeter
NTU	-	nephelometric turbidity units
pCi/L	-	picoCuries per liter
ppm	-	parts per million

Only analytes detected above reporting limits in at least one sample are included in this appendix. Additionally, results that are below the reporting limits are replaced with missing values (e.g., " < ") to emphasize the detected results. The following sections describe the analytes, reporting limits, and data qualifiers for each subappendix. A comprehensive list of the GWPP analytes, analytical methods, and reporting limits is provided in Appendix B, Table B.5.

E.1 Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals:

Results for all of the field measurements, miscellaneous analytes, and major ions are included in this appendix. The reporting limits for the major ions are shown in the following summary.

Analyte	Reporting Limit (mg/L)		Analyte	Reporting Limit (mg/L)	
	GWPP	BJC		GWPP	BJC
Cations			**Anions**		
Calcium	0.2	0.25	Bicarbonate	1.0	NS
Magnesium	0.2	0.05	Carbonate	1.0	NS
Potassium	2.0	0.25	Chloride	0.2	0.1
Sodium	0.2	0.25	Fluoride	0.1	0.05
			Nitrate (as Nitrogen)	0.028	0.1
			Sulfate	0.25	0.1
Note: "NS" = not specified.					

The major ion results for the sample collected from well GW-170 in August 2007 is qualitative because the ion charge balance error (percent) exceeds 20%. The geochemistry of samples from this well has reflected potential grout contamination since CY 2000, as shown by the elevated pH (typically > 12).

The Y-12 GWPP SAP (BWXT 2006a) specifies analytical methods and reporting limits for trace metals that are appropriate for DOE Order monitoring. The laboratories subcontracted for the monitoring programs managed by BJC may use reporting limits (sometimes reporting estimated values) that are lower than the GWPP reporting limits for the metals. For this report, the analytical methods for metals used by BJC monitoring programs (EPA-7470, SW846-6010B, SW846-6020, and ASTM-D5174-M) are considered to be functionally equivalent to the methods used by the GWPP (Table B.5). To retain the highest quality data for DOE Order monitoring purposes and to standardize reporting limits for trace metal results obtained from all sources, the GWPP reporting limits were given precedence over the BJC reporting limits (BJC 2006) shown below. The trace metals shown in bold typeface below were detected in at least one sample collected

EXPLANATION (continued)

during CY 2007 and are presented in Appendix E.1.

Analyte	Reporting Limit (mg/L)		Analyte	Reporting Limit (mg/L)	
	GWPP	BJC		GWPP	BJC
Aluminum	0.2	0.05*	**Lithium**	0.01	0.01
Antimony	0.0025	0.003	**Manganese**	0.005	0.005
Arsenic	0.005	0.005	**Mercury**	0.0002	0.0002
Barium	0.004	0.005	Molybdenum	0.05	0.01*
Beryllium	0.0005	0.001	**Nickel**	0.005	0.01
Boron	0.1	0.01*	Selenium	0.01	0.0025*
Cadmium	0.0025	0.00013*	Silver	0.02	0.0015*
Chromium	0.01	0.005*	**Strontium**	0.005	0.005
Cobalt	0.02	0.005*	**Thallium**	0.0005	0.001
Copper	0.02	0.005*	Thorium	0.2	NS
Iron	0.05	0.01*	**Uranium**	0.0005	0.004
Lead	0.0005	0.002	**Vanadium**	0.02	0.01*
			Zinc	0.05	0.01*
Note: * - the GWPP reporting limit is used instead of the BJC reporting limit (several BJC reporting limits were lowered in March 2007); "NS" - not specified.					

Groundwater samples collected from the following wells for metals analysis during CY 2007 were diluted before analysis to obtain an optimum matrix. The detected results are valid, but some metals may be present at concentrations below the elevated reporting limits.

Sampling Location	Date Sampled	Dilution Factor	Sampling Location	Date Sampled	Dilution Factor
GW-108	01/04/07	12	GW-253	03/08/07	6
GW-108	07/10/07	12	GW-274	03/13/07	10
GW-109	06/20/07	20	GW-275	03/13/07	10

The following symbols and qualifiers are used in Appendix E.1:

. - Not analyzed or not applicable
< - Analyzed but not detected at the project reporting level
[ ] - Calculated value for total uranium (GW-108) from isotopic activity by the laboratory.
E - Estimated concentration because of analytical interferences (BJC potassium results)
J - Positively identified; estimated concentration (BJC results).
Q - Result is inconsistent with historical measurements (e.g., low aluminum and chromium, yet high manganese and nickel in the September sample from well 56-4A).
R - Result does not meet data quality objectives (charge balance error that exceeds 20%).

EXPLANATION (continued)

E.2 Volatile Organic Compounds:

The Y-12 GWPP reporting limits for volatile organic compounds (Table B.5) and those used for monitoring programs managed by BJC are contract-required quantitation limits. Results below the quantitation limit and above the instrument detection limit are reported as estimated quantities. Therefore, non-detected results are assumed to equal zero for all compounds.

As summarized below, 36 compounds were detected in the CY 2007 groundwater samples collected in the East Fork Regime. Results for these compounds are grouped by similar chemical composition (e.g., chloroethenes) in Appendix E.2.

Compound	No. Detected	Maximum (µg/L)	Compound	No. Detected	Maximum (µg/L)
Tetrachloroethene	101	97,000	Total Xylene	3	8,000
Trichloroethene	90	8,600	2-Hexanone	3	120 E
cis-1,2-Dichloroethene	73	2,200	Bromoform	3	7
Chloroform	54	140	Chlorobenzene	3	1 J
Carbon tetrachloride	42	1,100	Ethylbenzene	2	1,000
1,1-Dichloroethene	37	190	4-Methyl-2-pentanone	2	230 E
Vinyl chloride	34	400	2-Butanone	2	32 Q
1,1,2-Trichloro-1,2,2-trifluoroethane	25	3,600	Carbon disulfide	2	7
trans-1,2-Dichloroethene	25	80	1,4-Dichlorobenzene	2	3 J
Methylene chloride	24	170 BD	1,2-Dichloroethane	1	530
Acetone	22	220 BD	Ethanol	1	150 J
1,1-Dichloroethane	22	92	Chloroethane	1	13
1,1,1-Trichloroethane	13	59	Chloromethane	1	8
Benzene	8	8,100	1,4-Dioxane	1	6 J
Dichlorodifluoromethane	8	48	Styrene	1	3 J
Toluene	4	3,300	1,1,1,2-Tetrachloroethane	1	2 J
1,2-Dichloropropane	4	11			

Also presented in Appendix E.2 are results for volatile organic gases (ethane, ethylene, and methane) as natural attenuation indicators for groundwater samples collected from nine wells in the East Fork Regime during CY 2007.

The following symbols and data qualifiers are used in Appendix E.2.

. - Not analyzed
< - Analyzed but not detected (also false-positive results)
B - Also detected in the associated method blank
D - Diluted before analysis: GW-151 (10X), GW-253 (5X), GW-382 (5X in March, 10X in August), and GW-762 (20X). The detected results are valid, but some VOCs may be present at concentrations below the elevated detection limits.
E - Exceeds calibration (estimated concentration)
FP - False-positive result (GWPP data): acetone in the September sample from well 56-6A.
J - Positively identified, estimated concentration below the contract-required quantitation limit
Q - Inconsistent with historical measurements for the location

EXPLANATION (continued)

E.3 Radiological Analytes:

Reporting limits for radiological analytes are sample-specific and analyte-specific minimum detectable activities that are reported with each result. The following summary shows the radiological analytes reported for at least one groundwater sample collected during CY 2007 in the East Fork Regime.

Analyte	No. of Results	No. Detected	Analyte	No. of Results	No. Detected
Gross Alpha	168	47	Uranium-234*	14	14
Gross Beta	168	76	Uranium-235*	14	6
Technetium-99	14	6	Uranium-236	4	1
			Uranium-238	14	12

Note: * = Reported by BJC laboratories in Appendix E.3 as equivalent GWPP analytes: U-233/234 = U-234; U-235/236 = U-235.

Results for gross alpha and gross beta are presented in the first four pages of Appendix E.3, followed by the results for the isotopes. The following notes and qualifiers apply to Appendix E.3:

- Result - Activity in picoCuries per liter (pCi/L)
- TPU - Total propagated uncertainty (two standard deviations); calculation includes the counting error (instrument uncertainty) as reported previously, plus other sources of uncertainty (e.g., volumetric, chemical yield)
- MDA - Minimum detectable activity
- . - Not analyzed
- < - Analyzed but less than the MDA (not detected)
- Q - Inconsistent with historical measurements for the location
- R - Result does not meet data quality objectives: exceeds the MDA but is less than the TPU

Additional Analyte Not Presented in Appendix E tables:

Methanol analysis was performed on groundwater samples collected from 12 monitoring wells during April (55-2A, 55-2B, 55-3A, 55-3B, 56-2A, and 56-2B) and August/September (55-2A, 55-2B, 55-3A, 55-3B, 55-3C, 56-3A, 56-3B, 56-3C, 56-4A, and 56-6A). Analytical results for all of the samples were below the reporting limit (5000 µg/L).

APPENDIX E.1

FIELD MEASUREMENTS, MISCELLANEOUS ANALYTES, MAJOR IONS, AND TRACE METALS

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	55-1A	55-2A			55-2B			55-2C	55-3A		
Functional Area	GRIDB2	GRIDB3			GRIDB3			GRIDB3	B9201-5		
Date Sampled	06/11/07	02/20/07	04/12/07	08/23/07	02/20/07	04/11/07	08/23/07	02/20/07	02/21/07	04/11/07	08/22/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type											
Field Measurements											
Time Sampled	11:15	9:05	9:10	9:00	10:20	9:10	11:00	11:15	9:10	9:55	8:30
Measuring Point Elev. (ft)	986.91	976.74	976.74	976.74	977.42	977.42	977.42	977.02	972.46	972.46	972.46
Depth to Water (ft)	11.09	8.86	8.39	8.91	8.23	7.61	8.50	8.24	12.31	11.90	12.35
Groundwater Elevation (ft)	975.82	967.88	968.35	967.83	969.19	969.81	968.92	968.78	960.15	960.56	960.11
Conductivity (μmho/cm)	1,025	1,789	2,200	1,854	2,540	2,380	2,450	2,510	702	706	764
Dissolved Oxygen (ppm)	0.36	9.65	1.04	0.7	0.3	0.13	0.15	0.93	3.62	3.76	0.96
Iron (++)	.	.	.	.	.	.	.	.	.	.	.
Manganese (++)	.	.	.	.	.	.	.	.	.	.	.
Oxidation/Reduction (mV)	83	168	178	190	183	171	206	172	119	146	162
Temperature (degrees C)	20.6	13.2	12.9	25.3	17.4	17.7	21.9	14.8	15.5	15.2	21.9
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.	.
pH	7.26	6.78	6.83	6.6	6.33	6.34	6.3	6.79	7.26	7.2	6.8
Miscellaneous Analytes											
Dissolved Solids (mg/L)	843	1,240	.	1,530	1,570	.	1,980	1,440	428	.	435
Suspended Solids (mg/L)	2	<	.	<	<	.	<	<	<	.	<
Turbidity (NTU)	12.8	0.274	.	0.28	1.14	.	2.05	0.854	0.522	.	0.104
Major Ions (mg/L)											
Calcium	145	314	.	297	365	.	384	260	107	.	113
Magnesium	17.2	20.9	.	20.3	32.2	.	33.2	45.7	14.2	.	16
Potassium	2.24	3.2	.	4.01	3.15	.	3.32	14	2.85	.	3.36
Sodium	26.8	10.2	.	10.6	11.2	.	11.8	89.7	9.17	.	10.1
Bicarbonate	142	198	.	218	131	.	134	204	132	.	146
Carbonate	<	<	.	<	<	.	<	<	<	.	<
Chloride	209	13	.	13	14.1	.	14.5	13.1	13.4	.	12.4
Fluoride	<	<	.	<	<	.	<	<	<	.	<
Nitrate as N	8.76	184	.	170	242	.	271	230	1.94	.	2.29
Sulfate	86	21.3	.	20.2	20.6	.	19.8	17.7	149	.	175
Charge balance error (%)	-6.1	0.0	.	-0.7	1.7	.	-0.8	-0.6	5.4	.	2.8
Trace Metals (mg/L)											
Aluminum	<	<	.	<	<	.	<	<	<	.	<
Antimony	<	<	.	<	<	.	<	<	<	.	<
Arsenic	<	<	.	<	<	.	<	<	<	.	<
Barium	0.0968	0.17	.	0.161	0.96	.	1.02	1.36	0.0413	.	0.0455
Beryllium	<	<	.	<	<	.	<	<	<	.	<
Boron	<	<	.	<	<	.	<	<	0.124	.	0.145
Cadmium	<	<	.	<	<	.	<	<	<	.	<
Chromium	0.149	<	.	<	<	.	<	<	<	.	<
Cobalt	<	<	.	<	<	.	<	<	<	.	<
Copper	<	<	.	<	<	.	<	<	<	.	<
Iron	1.13	<	.	<	0.0576	.	0.108	<	<	.	<
Lead	<	<	.	<	<	.	<	<	0.00329	.	<
Lithium	0.0286	<	.	<	0.0197	.	0.0226	0.0553	<	.	<
Manganese	0.344	0.0644	.	1.73	0.471	.	0.815	0.544	0.021	.	0.0137
Mercury	<	<	.	<	<	.	<	<	<	.	<
Nickel	0.448	0.00728	.	0.0151	0.00921	.	0.0129	0.00616	0.0154	.	0.0563
Strontium	0.267	0.744	.	0.714	1.2	.	1.25	5.6	0.279	.	0.294
Thallium	<	<	.	<	<	.	<	<	<	.	<
Uranium	<	0.00572	.	0.00287	<	.	<	<	0.00082	.	0.00071
Vanadium	<	<	.	<	<	.	<	<	<	.	<
Zinc	<	<	.	<	<	.	<	<	<	.	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	55-3B			55-3C		56-1A		56-2A		
Functional Area	B9201-5			B9201-5		Y12		GRIDC3		
Date Sampled	02/21/07	04/12/07	08/22/07	02/21/07	08/27/07	06/07/07	10/15/07	03/01/07		04/11/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type									Dup	
Field Measurements										
Time Sampled	10:20	10:00	9:55	11:15	10:15	9:05	14:00	8:50	8:50	11:00
Measuring Point Elev. (ft)	973.32	973.32	973.32	974.34	974.34	969.25	969.25	963.53	963.53	963.53
Depth to Water (ft)	13.45	12.92	13.73	14.32	14.28	7.56	7.54	8.80	8.80	8.82
Groundwater Elevation (ft)	959.87	960.40	959.59	960.02	960.06	961.69	961.71	954.73	954.73	954.71
Conductivity (μmho/cm)	457	542	436	510	524	446	442	682	682	640
Dissolved Oxygen (ppm)	0.39	1.89	0.15	0.93	0.94	2.02	1.16	0.53	0.53	0.42
Iron (++)	.	.	.	.	.	.	.	.	.	.
Manganese (++)	.	.	.	.	.	.	.	.	.	.
Oxidation/Reduction (mV)	-73	135	-78	47	136	133	115	121	121	25
Temperature (degrees C)	17.6	15.7	20.9	16.9	24.4	21	25.1	14.3	14.3	15.8
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.
pH	7.56	7.66	7.4	7.55	7.4	7.63	7.63	7.17	7.17	7.18
Miscellaneous Analytes										
Dissolved Solids (mg/L)	258	.	251	240	325	253	267	368	375	.
Suspended Solids (mg/L)	<	.	<	<	<	<	1	<	<	.
Turbidity (NTU)	1.27	.	0.4	0.35	0.277	0.235	0.156	1.62	1.56	.
Major Ions (mg/L)										
Calcium	61.4	.	62.2	57.1	69.5	57.8	57.3	106	106	.
Magnesium	12	.	12.8	13.6	16.3	10.2	9.76	8.11	8.36	.
Potassium	4.08	.	4.48	6.98	7.72	2.44	2.75	2.4	2.52	.
Sodium	3.95	.	4.05	14	12.7	12.4	12.2	8.63	8.87	.
Bicarbonate	136	.	131	166	173	132	136	195	188	.
Carbonate	<	.	<	<	<	<	<	<	<	.
Chloride	33.6	.	29.9	20.1	19.1	19.4	31.7	32.3	31.4	.
Fluoride	<	.	<	<	<	0.48	0.519	<	<	.
Nitrate as N	<	.	<	0.0339	0.337	0.59	0.617	0.404	0.425	.
Sulfate	31	.	32.2	41.1	63.8	53.2	51.1	71.1	71.6	.
Charge balance error (%)	0.2	.	3.7	0.1	1.9	-0.4	-5.4	0.6	2.1	.
Trace Metals (mg/L)										
Aluminum	<	.	<	<	<	<	<	<	<	.
Antimony	<	.	<	<	<	<	<	<	<	.
Arsenic	<	.	<	<	<	<	<	<	<	.
Barium	0.245	.	0.253	0.164	0.169	0.0516	0.0577	0.113	0.118	.
Beryllium	<	.	<	<	<	<	<	<	<	.
Boron	<	.	<	<	<	<	<	0.107	0.111	.
Cadmium	<	.	<	<	<	<	<	<	<	.
Chromium	<	.	<	<	<	<	<	<	<	.
Cobalt	<	.	<	<	<	<	<	<	<	.
Copper	<	.	<	<	<	<	<	<	<	.
Iron	0.161	.	0.0983	<	<	<	<	0.139	0.156	.
Lead	<	.	<	0.00079	<	<	<	<	<	.
Lithium	0.0156	.	0.0167	0.0198	0.0201	0.0159	0.0171	0.0143	0.0142	.
Manganese	0.0339	.	0.0685	0.0309	0.0344	<	<	<	<	.
Mercury	<	.	<	<	<	<	<	<	<	.
Nickel	<	.	<	<	<	0.0246	0.0259	0.0229	0.0222	.
Strontium	0.7	.	0.728	1.49	1.63	0.324	0.323	0.252	0.261	.
Thallium	<	.	<	<	<	<	<	<	<	.
Uranium	<	.	<	<	<	0.00188	0.00172	<	<	.
Vanadium	<	.	<	<	<	<	<	<	<	.
Zinc	<	.	0.123	<	<	<	<	<	<	.

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	56-2B		56-2C	56-3A			56-3B		56-3C	
Functional Area	GRIDC3		GRIDC3	Y12			Y12		Y12	
Date Sampled	03/05/07	04/12/07	03/05/07	02/22/07		08/30/07	02/22/07	09/04/07	02/22/07	09/05/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type					Dup					
Field Measurements										
Time Sampled	9:05	10:45	10:20	8:40	8:40	9:45	10:00	8:50	10:55	8:30
Measuring Point Elev. (ft)	962.45	962.45	965.11	963.03	963.03	963.03	964.33	964.33	962.86	962.86
Depth to Water (ft)	7.92	7.16	9.81	10.75	10.75	10.81	11.03	11.26	10.69	10.81
Groundwater Elevation (ft)	954.53	955.29	955.30	952.28	952.28	952.22	953.30	953.07	952.17	952.05
Conductivity (μmho/cm)	652	682	621	592	592	568	597	561	599	580
Dissolved Oxygen (ppm)	3.59	2.94	1.68	2.89	2.89	0.57	0.39	3.56	0.85	0.49
Iron (++)	.	.	.	.	.	.	.	.	.	.
Manganese (++)	.	.	.	.	.	.	.	.	.	.
Oxidation/Reduction (mV)	122	127	75	118	118	137	119	135	119	128
Temperature (degrees C)	12.3	16.8	13.5	14.3	14.3	22.1	18.3	19.9	17.4	20.4
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.
pH	7.5	7.51	8.57	7.33	7.33	7.12	7.15	7.1	7.24	7.2
Miscellaneous Analytes										
Dissolved Solids (mg/L)	377	.	339	322	314	320	327	341	354	372
Suspended Solids (mg/L)	<	.	<	<	<	<	<	<	1	<
Turbidity (NTU)	0.133	.	1.47	0.274	0.293	0.235	0.209	0.099	4.63	2.07
Major Ions (mg/L)										
Calcium	90.7	.	5.71	102	99.4	100	109	105	107	101
Magnesium	12.9	.	1.78	7.7	7.41	7.41	4.52	4.72	6.58	6.59
Potassium	2.79	.	4.54	<	<	<	<	<	2.07	2.02
Sodium	11.9	.	123	3.66	3.58	4.09	5.51	6.22	8.3	8.36
Bicarbonate	175	.	219	201	198	213	184	179	163	157
Carbonate	<	.	<	<	<	<	<	<	<	<
Chloride	13.9	.	23.4	16.5	16.2	16.3	18.5	17.3	16.6	16.6
Fluoride	<	.	0.503	<	<	<	<	<	<	<
Nitrate as N	1.57	.	<	0.741	0.696	0.657	0.754	0.87	0.989	1.13
Sulfate	104	.	25.8	51.8	51.4	47	66.2	65.7	99.5	93.7
Charge balance error (%)	0.1	.	2.6	2.3	1.7	0.3	3.6	3.5	3.5	3.1
Trace Metals (mg/L)										
Aluminum	<	.	<	<	<	<	<	<	<	<
Antimony	<	.	<	<	<	<	<	<	<	<
Arsenic	<	.	<	<	<	<	<	<	<	<
Barium	0.0564	.	0.133	0.103	0.1	0.113	0.107	0.107	0.0732	0.071
Beryllium	<	.	<	<	<	<	<	<	<	<
Boron	0.129	.	1.15	<	<	0.108	<	<	<	<
Cadmium	<	.	<	<	<	<	<	<	<	<
Chromium	<	.	<	<	<	<	<	<	<	<
Cobalt	<	.	<	<	<	<	<	<	<	<
Copper	<	.	<	<	<	<	<	<	<	<
Iron	<	.	0.0942	<	<	<	<	<	0.153	0.0896
Lead	<	.	<	<	0.00122	<	<	<	0.00451	<
Lithium	0.018	.	0.0817	<	<	<	<	<	<	0.0102
Manganese	<	.	<	<	<	0.00627	<	<	<	<
Mercury	<	.	<	<	<	<	<	<	<	<
Nickel	<	.	<	0.0133	0.013	0.0158	<	<	<	<
Strontium	0.313	.	0.333	0.161	0.156	0.158	0.153	0.149	0.195	0.186
Thallium	<	.	<	<	<	<	<	<	<	<
Uranium	<	.	<	0.00076	0.00074	0.00077	0.00052	0.000555	<	<
Vanadium	<	.	<	<	<	<	<	<	<	<
Zinc	<	.	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	56-4A			56-6A			60-1A		GW-105	GW-106
Functional Area	Y12			Y12			Y12		S3	S3
Date Sampled	02/26/07	09/05/07	09/06/07	02/26/07	09/06/07		05/30/07	11/19/07	06/14/07	06/18/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type						Dup				
Field Measurements										
Time Sampled	11:00	10:30	11:40	9:30	8:10	8:10	9:35	9:10	9:15	10:20
Measuring Point Elev. (ft)	962.07	962.07	.	960.28	960.28	960.28	929.66	929.66	1,018.20	1,016.92
Depth to Water (ft)	10.40	10.44	.	11.14	12.48	12.48	12.92	12.74	9.14	5.51
Groundwater Elevation (ft)	951.67	951.63	.	949.14	947.80	947.80	916.74	916.92	1,009.06	1,011.41
Conductivity (μmho/cm)	274	292	.	620	714	714	496	525	5,540	5,340
Dissolved Oxygen (ppm)	4.9	1.02	.	3.07	0.93	0.93	0.29	0.58	2.16	0.52
Iron (++)	.	.	.	.	.	.	.	.	.	.
Manganese (++)	.	.	.	.	.	.	.	.	.	.
Oxidation/Reduction (mV)	118	-69	.	116	-43	-43	-71	-71	221	192
Temperature (degrees C)	14.6	26.6	.	14.9	22.3	22.3	20.1	17.8	20.8	22.9
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.
pH	7.43	6.74	.	7.53	7.26	7.26	7.31	7.18	6.6	6.83
Miscellaneous Analytes										
Dissolved Solids (mg/L)	143	.	165	346	432	431	325	312	3,220	3,800
Suspended Solids (mg/L)	5	.	3	<	<	<	<	1	4	<
Turbidity (NTU)	13.6	5.97	.	0.851	1.38	1.22	3.21	13.9	2.66	0.15
Major Ions (mg/L)										
Calcium	35.1	.	40.7	73.9	85.4	85.6	80.9	87.6	889	729
Magnesium	4.75	.	5.21	33	35.4	34.8	10.1	8.07	115	175
Potassium	<	.	<	2.46	2.14	2.27	<	<	12.3	12.7
Sodium	9.57	.	11	18.6	21	20.6	8.58	7.46	20.3	32.4
Bicarbonate	88.9	111	.	321	352	366	211	215	136	122
Carbonate	<	<	.	<	<	<	<	<	<	<
Chloride	2.04	1.47	.	9.33	8.11	8.09	5.37	6.41	18.1	11.1
Fluoride	0.139	0.102	.	0.11	<	0.102	<	<	<	<
Nitrate as N	1.64	0.0542	.	0.07	<	<	<	<	713	702
Sulfate	28.7	17.9	.	10.8	7.91	7.78	64.8	54.3	5.85	17.6
Charge balance error (%)	0.0	.	.	2.5	4.6	2.4	-4.4	-2.3	0.7	-0.7
Trace Metals (mg/L)										
Aluminum	1.03	.	< Q	<	<	<	<	<	0.219	<
Antimony	<	.	<	<	<	<	<	<	<	<
Arsenic	<	.	<	<	<	<	<	<	<	<
Barium	0.056	.	0.0755	0.277	0.32	0.313	0.112	0.111	5.11	3.11
Beryllium	<	.	<	<	<	<	<	<	<	<
Boron	<	.	<	<	<	<	<	<	<	0.101
Cadmium	<	.	<	<	<	<	<	<	<	<
Chromium	0.0615	.	< Q	0.0207	<	<	<	<	<	0.0554
Cobalt	<	.	<	<	<	<	<	<	<	<
Copper	<	.	<	<	<	<	<	<	<	<
Iron	0.543	.	0.294	<	0.201	0.198	0.455	1.37	0.0919	<
Lead	0.00138	.	<	<	<	<	<	0.00221	<	<
Lithium	<	.	<	0.0114	0.0112	0.0118	1.32	1.41	0.035	0.0701
Manganese	0.00881	.	1.19 Q	<	0.358	0.355	0.616	1.76	0.052	0.0648
Mercury	<	.	<	<	<	<	<	<	<	<
Nickel	0.0127	.	0.148 Q	0.0051	0.013	0.0129	<	<	0.0567	0.0448
Strontium	0.0641	.	0.0717	0.361	0.393	0.386	0.262	0.23	2.08	20.1
Thallium	<	.	<	<	<	<	<	<	<	<
Uranium	<	.	<	<	<	<	<	<	0.00093	0.0025
Vanadium	<	.	<	<	<	<	<	<	<	<
Zinc	<	.	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-108		GW-109	GW-151		GW-153	GW-154		GW-169	
Functional Area	S3		S3	NHP		NHP	NHP		EXP-UV	
Date Sampled	01/04/07	07/10/07	06/20/07	03/01/07	08/01/07	03/08/07	03/05/07	08/15/07	03/01/07	08/02/07
Program	BJC	BJC	GWPP	BJC	BJC	GWPP	BJC	BJC	BJC	BJC
Sample Type										
Field Measurements										
Time Sampled	14:15	9:45	10:40	14:10	14:35	10:35	9:00	13:10	14:00	10:40
Measuring Point Elev. (ft)	999.00	999.00	997.82	916.17	916.17	921.68	911.70	911.70	932.12	932.12
Depth to Water (ft)	6.98	7.27	6.29	15.91	15.91	20.34	9.21	10.09	32.80	30.90
Groundwater Elevation (ft)	992.02	991.73	991.53	900.26	900.26	901.34	902.49	901.61	899.32	901.22
Conductivity (μmho/cm)	55,700	55,500	46,900	1,076	1,011	461	435	826	219	878
Dissolved Oxygen (ppm)	4.48	0.72	0.17	0.51	1.15	4.32	10.62	7.23	8.47	4.4
Iron (++)	.	.	.	0	.	.	0.01	.	.	.
Manganese (++)	.	.	.	0.2	.	.	0.2	.	.	.
Oxidation/Reduction (mV)	298	157	204	189	39	132	150	132	210	5
Temperature (degrees C)	19.2	22	22.6	14.5	22	14.3	12.4	24.5	13.8	15.7
Turbidity (NTU)	0	2	.	1	2	.	26	3	167	7
pH	5.56	5.42	5.5	7.38	7.46	7.69	7.13	6.96	8.47	8.38
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	52,100	300	324	224	191	541	179	257
Suspended Solids (mg/L)	.	.	4	<	<	<	<	5	6	14
Turbidity (NTU)	.	.	2.07	.	.	1.84	.	.	.	.
Major Ions (mg/L)										
Calcium	9,520	9,430	11,300	58.4	58.6 J	47.9	141	133 J	58.8	69.1 J
Magnesium	1,050	981	1,450	26.3	27.5	20	18.9	21.5	3.05	4.28
Potassium	26.2	21.3	87.5	2.04	2.49 E	<	4.98	7.35	2.25	2.96 E
Sodium	501	430	444	7.01	7.56	9.67	5.21	8.02	1.06	1.39
Bicarbonate	776	769	496	223	208	175	.	.	156	182
Carbonate	<	<	<	<	<	<	.	.	<	<
Chloride	199	134	114	17.9	18.6	15.7	.	.	1.4	1.6
Fluoride	<	<	3.88	0.12	0.24	0.17	.	.	<	0.12
Nitrate as N	6,580	6,370	9,350	0.78	0.78	1.09	.	.	0.77	0.81
Sulfate	7.5	<	<	22	19.5	15.9	.	.	4	5.5
Charge balance error (%)	8.6	9.1	1.7	-0.8	3.6	1.1	.	.	-0.8	0.4
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	0.202	<	0.247	0.83
Antimony	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	75.2	71.7	87.7	0.171	0.181	0.0462	0.0906	0.0703	0.0272	0.0338
Beryllium	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	0.121	<	<
Cadmium	<	<	1.26	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Cobalt	0.146	0.151	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	<	<	<	<	<	<	0.288	<	0.375	0.637 J
Lead	<	<	0.00487	<	<	<	<	<	<	<
Lithium	<	0.453	0.749	<	<	<	<	<	<	<
Manganese	141	135	80.3	<	<	<	1.05	0.346	0.0133	0.0228
Mercury	<	<	0.00563	.	.	<	.	.	.	.
Nickel	0.196	0.182	2.53	<	<	<	<	<	<	<
Strontium	28.8	27.5	69	0.521	0.541	0.149	0.406	0.463	0.0721	0.0888
Thallium	<	<	0.0016	<	<	<	<	<	<	<
Uranium	[0.0166]	[0.0143]	0.0226	<	<	0.00164	0.3	0.44	.	.
Vanadium	<	<	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-170				GW-171	GW-172	GW-192	GW-193		GW-204	GW-219
Functional Area	**EXP-UV**				**EXP-UV**	**EXP-UV**	**B4**	**T2331**		**T0134**	**UOV**
Date Sampled	**03/01/07**		**08/02/07**		**03/07/07**	**03/07/07**	**06/11/07**	**01/04/07**	**07/09/07**	**11/13/07**	**11/28/07**
Program	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**GWPP**	**BJC**	**BJC**	**GWPP**	**GWPP**
Sample Type		**Dup**		**Dup**							
Field Measurements											
Time Sampled	10:20	.	9:50	.	13:45	13:10	9:35	9:40	9:30	9:05	13:50
Measuring Point Elev. (ft)	932.64	.	932.64	.	920.72	926.69	1,008.83	934.17	934.17	958.74	935.83
Depth to Water (ft)	35.98	.	35.87	.	7.95	16.99	7.32	9.18	9.78	8.76	9.47
Groundwater Elevation (ft)	896.66	.	896.77	.	912.77	909.70	1,001.51	924.99	924.39	949.98	926.36
Conductivity (μmho/cm)	1,761	.	3,050	.	366	1,095	583	825	1,222	401	719
Dissolved Oxygen (ppm)	0.26	.	0.37	.	1.19	2.24	0.62	2.01	2.46	2.09	3.34
Iron (++)	.	.	.	.	0.15	0.01	.	.	.	.	.
Manganese (++)	.	.	.	.	2.6	0.7	.	.	.	.	.
Oxidation/Reduction (mV)	-69	.	-282	.	9	-72	52	220	31	149	137
Temperature (degrees C)	14.4	.	16.7	.	17.4	16.3	18.8	11.5	25.8	20.4	17.2
Turbidity (NTU)	8	.	8	.	30	1	.	1	1	.	.
pH	11.72	.	12.18	.	6.57	7.21	6.46	7.6	7.46	7.59	7.09
Miscellaneous Analytes											
Dissolved Solids (mg/L)	328	331	402	360	215	282	340	.	.	234	421
Suspended Solids (mg/L)	16	8	11	13	45	7	3	.	.	<	<
Turbidity (NTU)	.	.	.	.	.	.	8.33	.	.	0.211	0.616
Major Ions (mg/L)											
Calcium	108	113	122 J	120 J	.	.	101	.	.	60.7	127
Magnesium	2.51	2.92	3.73	2.58	.	.	9.39	.	.	10.1	12.8
Potassium	15.2	15.6	15.9 E	15.6 E	.	.	<	.	.	2.26	3.45
Sodium	6.74	6.92	7.47	7.38	.	.	9.01	.	.	2.48	12.4
Bicarbonate	<	<	<	<	.	.	262	.	.	135	307
Carbonate	41	32.8	32.3	40.4	.	.	<	.	.	<	<
Chloride	7.1	6.8	7	6.7	.	.	29.1	.	.	1.93	2.47
Fluoride	0.12	0.1	0.23	0.23	.	.	0.124	.	.	0.354	<
Nitrate as N	0.24	0.22	0.23	0.24	.	.	<	.	.	0.786	0.111
Sulfate	6.3	6.4	6.3	6.1	.	.	5.07	.	.	57.3	67.7
Charge balance error (%)	-1.8	.	-38.9 R	.	.	.	0.3	.	.	0.1	2.5
Trace Metals (mg/L)											
Aluminum	0.362	0.43	0.579	0.426	.	.	<	.	.	<	<
Antimony	<	<	<	<	.	.	<	.	.	0.00276	<
Arsenic	<	<	<	<	.	.	<	.	.	<	<
Barium	0.127	0.128	0.148	0.146	.	.	0.142	.	.	0.0927	0.0782
Beryllium	<	<	<	<	.	.	<	.	.	<	<
Boron	<	<	<	<	.	.	<	.	.	<	<
Cadmium	<	<	<	<	.	.	<	.	.	<	<
Chromium	<	<	<	<	.	.	<	.	.	<	<
Cobalt	<	<	<	<	.	.	<	.	.	<	<
Copper	<	<	<	<	.	.	<	.	.	<	<
Iron	1.03	0.773	1.41 J	1.12 J	.	.	1.91	.	.	0.0668	<
Lead	<	<	<	<	.	.	<	.	.	<	<
Lithium	0.0439	0.0447	0.043	0.0424	.	.	0.0168	.	.	0.0518	<
Manganese	0.0074	0.0063	0.0103	0.0079	.	.	2.06	.	.	0.00611	<
Mercury	.	.	.	.	.	.	<	.	.	<	<
Nickel	<	<	<	<	.	.	0.00732	.	.	<	0.0202
Strontium	0.6	0.609	0.617	0.612	.	.	0.165	.	.	0.125	0.216
Thallium	<	<	<	<	.	.	<	.	.	<	<
Uranium	.	.	.	.	.	.	<	.	.	0.122	0.746
Vanadium	<	<	<	<	.	.	<	.	.	<	<
Zinc	<	<	<	<	.	.	<	.	.	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-220		GW-223		GW-230	GW-240	GW-251	GW-253	GW-265		
Functional Area	NHP		NHP		EXP-UV	NHP	S2	S2	SY		
Date Sampled	06/04/07	11/20/07	03/06/07	08/06/07	03/07/07	03/08/07	06/25/07	03/08/07	06/05/07		10/17/07
Program	GWPP	GWPP	BJC	BJC	BJC	GWPP	GWPP	BJC	GWPP	GWPP	GWPP
Sample Type										Dup	
Field Measurements											
Time Sampled	10:40	13:40	9:30	11:35	11:00	9:40	9:55	13:40	10:10	10:10	9:25
Measuring Point Elev. (ft)	915.64	915.64	911.62	911.62	923.11	922.90	1,003.80	1,004.24	1,032.68	1,032.68	1,032.68
Depth to Water (ft)	15.74	15.70	9.65	10.04	13.55	21.13	23.90	7.20	12.42	12.42	13.55
Groundwater Elevation (ft)	899.90	899.94	901.97	901.58	909.56	901.77	979.90	997.04	1,020.26	1,020.26	1,019.13
Conductivity (μmho/cm)	514	537	353	138	1,853	492	922	10,700	358	358	348
Dissolved Oxygen (ppm)	2.55	0.12	3.67	2.35	0.34	2.48	0.93	0.93	1.58	1.58	1.03
Iron (++)	.	.	0	.	0.04	.	.	0.05	.	.	.
Manganese (++)	.	.	0.4	.	0.9	.	.	59	.	.	.
Oxidation/Reduction (mV)	86	83	-22	13	-30	122	266	347	184	184	174
Temperature (degrees C)	17.9	17	14.7	24	15.4	12.9	20.3	15.2	19.2	19.2	19.3
Turbidity (NTU)	.	.	1	1	2	.	.	3	.	.	.
pH	7.46	7.52	6.95	7.16	6.81	7.43	6.49	5.01	6.46	6.46	6.54
Miscellaneous Analytes											
Dissolved Solids (mg/L)	283	271	351	418	601	243	604	3,940	210	210	198
Suspended Solids (mg/L)	1	2	10	5	<	<	<	<	<	<	<
Turbidity (NTU)	1.36	2.43	.	.	.	3.11	0.496	.	0.125	0.129	0.111
Major Ions (mg/L)											
Calcium	61.2	63.3	91.8	86.4 J	.	52.8	109	453	41.5	41.5	40.1
Magnesium	26.9	25.4	12.7	12	.	18.5	15.8	111	7.18	7.37	6.95
Potassium	2.43	2.46	1.88	1.71	.	2.33	2.8	7.39	<	<	<
Sodium	5.73	5.59	10.2	10	.	11.8	11.5	114	13.2	13.4	13.4
Bicarbonate	234	225	222	236	.	179	202	56.6	120	122	101
Carbonate	<	<	<	<	.	<	<	<	<	<	<
Chloride	17.1	18.3	19.7	21.9	.	15.8	5.68	112	21	20.4	19.1
Fluoride	<	<	0.18	0.36	.	0.204	1.32	4.2	<	<	<
Nitrate as N	0.635	0.587	<	<	.	1.57	49.7	551	0.104	0.102	0.126
Sulfate	17.3	16.7	37.3	31.8	.	21.1	16	97.4	21	21	20.7
Charge balance error (%)	0.1	1.4	2.1	-2.7	.	1.5	-5.4	-10.9	-3.0	-2.9	2.6
Trace Metals (mg/L)											
Aluminum	<	<	<	<	.	0.234	<	3.49	<	<	<
Antimony	<	<	<	<	.	<	<	<	<	<	<
Arsenic	<	<	<	<	.	<	<	0.0051	<	<	<
Barium	0.113	0.105	0.28	0.268	.	0.0433	0.0843	0.228	0.245	0.249	0.237
Beryllium	<	<	<	<	.	<	<	0.0106	<	<	<
Boron	<	<	<	<	.	<	<	0.34	<	<	<
Cadmium	<	<	<	<	.	<	0.0705	2.94	<	<	<
Chromium	<	<	<	<	.	<	<	<	<	<	<
Cobalt	<	<	<	<	.	<	<	0.229	<	<	<
Copper	<	<	<	<	.	<	0.129	55.8	<	<	<
Iron	0.0672	0.141	0.267	0.275	.	0.101	<	0.197	<	<	<
Lead	0.00079	0.00838	<	<	.	<	<	0.0219	<	<	<
Lithium	<	<	<	<	.	<	<	0.0682	<	<	<
Manganese	<	<	0.555	0.545	.	<	2.05	41.5	<	<	<
Mercury	<	<	.	.	.	<	<	.	<	<	<
Nickel	<	<	<	<	.	<	0.0177	1.79	<	<	<
Strontium	0.454	0.429	0.234	0.242	.	0.0862	0.161	0.804	0.148	0.151	0.141
Thallium	<	<	<	<	.	<	0.00144	0.0087	<	<	<
Uranium	<	<	0.041	0.038	.	0.0048	0.00458	0.0041	<	<	<
Vanadium	<	<	<	<	.	<	<	<	<	<	<
Zinc	<	<	<	<	.	<	<	5.08	<	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-269		GW-270		GW-272	GW-273	GW-274	GW-275	GW-281	GW-332	GW-336
Functional Area	SY		SY		SY	SY	SY	SY	FF	WCPA	WCPA
Date Sampled	06/05/07	10/17/07	06/06/07		03/14/07	06/06/07	03/13/07	03/13/07	05/01/07	03/06/07	03/06/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	GWPP	GWPP
Sample Type				Dup							
Field Measurements											
Time Sampled	11:40	11:10	9:25	9:25	10:10	11:25	10:30	11:25	13:40	10:45	9:45
Measuring Point Elev. (ft)	1,027.81	1,027.81	1,008.96	1,008.96	1,009.16	1,003.52	995.60	995.53	946.10	981.24	985.92
Depth to Water (ft)	19.00	20.63	3.41	3.41	7.64	7.55	4.21	4.17	6.21	10.64	10.61
Groundwater Elevation (ft)	1,008.81	1,007.18	1,005.55	1,005.55	1,001.52	995.97	991.39	991.36	939.89	970.60	975.31
Conductivity (μmho/cm)	190	145	1,179	1,179	5,960	148	12,870	32,100	744	265	424
Dissolved Oxygen (ppm)	1.1	0.93	0.93	0.93	2.02	0.34	1.73	0.67	0.78	2.42	1.54
Iron (++)	.	.	.	.	.	.	.	.	.	.	.
Manganese (++)	.	.	.	.	.	.	.	.	.	.	.
Oxidation/Reduction (mV)	202	220	148	148	196	229	257	136	50	220	155
Temperature (degrees C)	20.9	20.6	21.3	21.3	18.5	19.9	14.7	15.3	16.8	15.3	13.9
Turbidity (NTU)	.	.	.	.	.	.	.	.	27	.	.
pH	5.97	5.96	7.29	7.29	6.77	5.42	5.64	6.57	6.46	5.99	6.5
Miscellaneous Analytes											
Dissolved Solids (mg/L)	126	110	772	809	3,680	109	12,000	45,500	.	138	213
Suspended Solids (mg/L)	<	<	9	<	<	<	6	<	.	<	1
Turbidity (NTU)	0.163	0.246	0.252	0.259	0.256	0.331	2.91	0.309	.	0.195	0.297
Major Ions (mg/L)											
Calcium	19.4	14.9	154	151	770	17.1	2430	9,440	.	28	57
Magnesium	2.48	2.16	29.5	29.6	141	2.97	384	1,410	.	4	6.2
Potassium	<	<	5.37	5.43	4.61	<	<	34.8	.	<	<
Sodium	8.89	9.25	13.4	13.5	15.7	5.56	246	121	.	7.16	6.2
Bicarbonate	67.4	56.5	228	226	92.5	50.1	617	54.1	.	68.6	149
Carbonate	<	<	<	<	<	<	<	<	.	<	<
Chloride	4.58	4.09	12.6	13.6	5.64	19.2	59.7	51.7	.	11.5	10.7
Fluoride	<	<	<	<	<	<	<	<	.	<	<
Nitrate as N	0.621	0.614	65.1	67.1	661	<	2,120	8,560	.	2	1.7
Sulfate	5.89	5.49	41.4	44	10.2	0.36	3.01	<	.	10.8	9.12
Charge balance error (%)	-2.6	-2.9	1.9	0.4	1.4	-7.2	-0.6	-1.7	.	-0.3	0.5
Trace Metals (mg/L)											
Aluminum	<	<	<	<	<	<	<	<	.	<	<
Antimony	<	<	<	<	<	<	<	<	.	<	<
Arsenic	<	<	<	<	<	<	<	<	.	<	<
Barium	0.0604	0.0531	0.16	0.159	2.57	0.104	14.9	147	.	0.121	0.178
Beryllium	<	<	<	<	<	<	<	<	.	<	<
Boron	<	<	<	<	<	<	<	<	.	<	<
Cadmium	<	<	<	<	<	<	<	<	.	<	<
Chromium	<	<	<	<	<	<	<	<	.	<	<
Cobalt	<	<	<	<	<	<	<	<	.	<	<
Copper	<	<	<	<	<	<	<	<	.	<	<
Iron	<	<	<	<	<	0.069	<	<	.	<	<
Lead	0.00059	0.00129	<	<	0.00076	<	<	0.00136	.	0.00263	0.00314
Lithium	<	0.0107	0.0234	0.0259	0.041	<	<	0.406	.	<	<
Manganese	<	<	0.0233	0.0214	<	0.679	64.6	1.8	.	<	0.00677
Mercury	<	<	<	<	<	<	0.00037	<	.	<	<
Nickel	<	<	0.0088	0.0087	0.00862	0.0061	0.166	0.129	.	<	<
Strontium	0.0438	0.0368	2.17	2.18	1.6	0.0792	7.53	74.2	.	0.114	0.161
Thallium	<	<	<	<	<	<	<	<	.	<	<
Uranium	<	<	0.00104	0.00102	0.0794	<	0.0137	0.00162	.	<	<
Vanadium	<	<	<	<	<	<	<	<	.	<	<
Zinc	<	<	<	<	<	<	<	<	.	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-337	GW-380		GW-381	GW-382		GW-383			GW-505
Functional Area	WCPA	NHP		NHP	NHP		NHP			RG
Date Sampled	03/06/07	03/05/07	08/15/07	12/04/07	03/06/07	08/02/07	06/20/07	11/19/07		06/18/07
Program	GWPP	BJC	BJC	GWPP	BJC	BJC	GWPP	GWPP	GWPP	GWPP
Sample Type									Dup	
Field Measurements										
Time Sampled	8:35	14:15	9:45	10:20	12:50	11:00	9:20	13:45	13:45	9:00
Measuring Point Elev. (ft)	987.48	913.55	913.55	913.36	913.17	913.17	908.77	908.77	908.77	1,015.19
Depth to Water (ft)	11.13	11.04	11.44	11.37	11.85	11.23	9.48	9.39	9.39	6.76
Groundwater Elevation (ft)	976.35	902.51	902.11	901.99	901.32	901.94	899.29	899.38	899.38	1,008.43
Conductivity (μmho/cm)	608	249	462	665	411	529	581	588	588	451
Dissolved Oxygen (ppm)	2.79	6.88	4.33	0.39	4.72	3.38	0.24	0.68	0.68	0.83
Iron (++)	.	0.29	.	.	0.13	.	.	.	.	.
Manganese (++)	.	0.1	.	.	0.2	.	.	.	.	.
Oxidation/Reduction (mV)	150	129	55	-134	181	189	-33	-39	-39	198
Temperature (degrees C)	12.8	15.9	21.6	15	16.5	23.2	19.2	19.9	19.9	24
Turbidity (NTU)	.	172	11	.	26	48	.	.	.	.
pH	6.79	6.89	6.9	7.32	7.21	7.4	7.08	7.22	7.22	6.25
Miscellaneous Analytes										
Dissolved Solids (mg/L)	305	249	299	380	404	431	333	328	326	188
Suspended Solids (mg/L)	<	51	9	13	14	<	<	<	<	5
Turbidity (NTU)	0.366	.	.	140	.	.	2.51	6.96	7.38	5.9
Major Ions (mg/L)										
Calcium	87.4	37.3	48 J	98.8	84.1	79.7 J	97.3	89.7	93.9	50.7
Magnesium	8.7	14.5	18.3	20.2	22.7	24.4	11.9	10.7	11.2	8.56
Potassium	<	1.17	1.79	3.19	3.6	4.37 E	2.66	2.77	2.91	<
Sodium	5.13	11.4	13.5	18.7	18.6	18.9	13.4	12.2	12.8	4.32
Bicarbonate	216	141	140	281	250	250	230	233	226	99.4
Carbonate	<	<	<	<	<	<	<	<	<	<
Chloride	17.3	12.3	15.4	60.8	65.1	63.7	31.4	34.6	35	13.6
Fluoride	<	0.2	0.36	<	0.17	0.3	<	<	<	0.415
Nitrate as N	3.93	1.8	1.5	<	0.091	0.16	<	<	<	0.535
Sulfate	12.6	30.6	32.4	2.94	3.9	3.8	18.1	17.3	17.6	27.3
Charge balance error (%)	-0.4	-5.3	5.4	0.6	-0.3	-0.4	5.1	-0.3	3.0	6.6
Trace Metals (mg/L)										
Aluminum	<	0.443	<	<	<	<	<	<	<	0.347
Antimony	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.212	0.0305	0.0369	0.294	0.538	0.526	0.636	0.578	0.602	0.0945
Beryllium	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	<	<	<
Cadmium	<	<	<	<	<	<	<	<	<	<
Chromium	<	2.19	0.0826	<	<	<	<	0.0531	0.0267	0.205
Cobalt	<	0.0217	<	<	<	<	<	<	<	<
Copper	<	0.0227	<	<	<	<	<	<	<	<
Iron	<	8.57	0.33	10.3	0.779	1.99 J	0.388	0.987	0.882	0.783
Lead	<	<	<	0.0114	<	<	0.0007	<	<	<
Lithium	<	<	<	<	<	<	0.0154	0.0151	0.0145	<
Manganese	<	0.275	0.0355	0.485	0.0254	0.0283	0.275	0.146	0.145	0.138
Mercury	<	.	.	<	.	.	<	<	<	<
Nickel	<	0.287	0.219	<	<	<	0.00629	<	<	0.027
Strontium	0.229	0.0472	0.0593	0.203	0.294	0.301	0.435	0.399	0.415	0.112
Thallium	<	<	<	<	<	<	<	<	<	<
Uranium	0.00114	<	<	<	<	<	<	<	<	0.0124
Vanadium	<	<	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-605				GW-606		GW-618	GW-620	GW-656	GW-658
Functional Area	EXP-I				EXP-I		EXP-E	FTF	T0134	FF
Date Sampled	01/03/07		07/09/07		01/03/07	07/09/07	03/08/07	06/19/07	11/13/07	05/01/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP	BJC
Sample Type		Dup		Dup						
Field Measurements										
Time Sampled	14:45	.	10:15	.	14:30	14:00	10:35	9:20	10:20	9:55
Measuring Point Elev. (ft)	919.06	.	919.06	.	919.59	919.59	985.14	1,015.57	954.79	944.81
Depth to Water (ft)	11.25	.	11.35	.	13.43	14.28	13.67	29.66	10.39	12.08
Groundwater Elevation (ft)	907.81	.	907.71	.	906.16	905.31	971.47	985.91	944.40	932.73
Conductivity (μmho/cm)	374	.	708	.	900	747	1,171	253	656	268
Dissolved Oxygen (ppm)	1.43	.	1.24	.	1.22	1.34	0.5	5.93	0.33	1.61
Iron (++)	.	.	.	.	.	.	0	.	.	.
Manganese (++)	.	.	.	.	.	.	0.5	.	.	.
Oxidation/Reduction (mV)	121	.	75	.	178	137	-6	43	-14	-106
Temperature (degrees C)	16.1	.	20.9	.	15.2	21.7	16.9	22.7	22.2	21.4
Turbidity (NTU)	2	.	1	.	3	1	2	.	.	16
pH	7.11	.	7.32	.	7.52	7.48	7.04	9.94	6.79	6.31
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	.	.	.	.	327	79	378	.
Suspended Solids (mg/L)	.	.	.	.	.	.	<	<	1	.
Turbidity (NTU)	.	.	.	.	.	.	.	0.466	6.22	.
Major Ions (mg/L)										
Calcium	95.1	97.6	83.9	86.8	87.4	76.9	95.5	2.3	108	.
Magnesium	22.7	23.2	19.8	20.5	43.6	37.7	8.87	<	5.57	.
Potassium	2.73	2.76	2.1	2.16	3.4	3.54	4.29	25.1	2.35	.
Sodium	18.4	18.8	12.8	13.2	6.95	5.86	13.4	2.99	13.3	.
Bicarbonate	307	281	277	273	305	319	287	32.7	216	.
Carbonate	<	<	<	<	<	<	<	<	<	.
Chloride	31	30.8	24.3	24.2	23.2	20.3	9	2.03	34.4	.
Fluoride	0.13	0.11	0.11	0.11	0.21	0.21	0.25	0.131	<	.
Nitrate as N	0.16	0.16	0.056	0.06	9.2	7.5	0.34	1.34	<	.
Sulfate	36.2	35.7	27	27.6	58.1	52.7	19	5.79	49	.
Charge balance error (%)	-2.2	.	-3.1	.	-1.9	-8.7	-2.5	-7.0	1.4	.
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	<	0.247	<	.
Antimony	<	<	<	<	<	<	<	<	<	.
Arsenic	<	<	<	<	<	<	<	<	<	.
Barium	0.0498	0.0502	0.0414	0.043	0.192	0.177	0.0422	0.00971	0.153	.
Beryllium	<	<	<	<	<	<	<	<	<	.
Boron	<	<	<	<	<	<	0.113	<	<	.
Cadmium	<	<	<	<	<	<	0.0042	<	<	.
Chromium	<	<	<	<	<	<	<	<	<	.
Cobalt	<	<	<	<	<	<	<	<	<	.
Copper	<	<	<	<	<	<	<	<	<	.
Iron	<	0.0545	<	<	<	<	0.314	<	1	.
Lead	<	<	<	<	<	<	<	<	<	.
Lithium	<	<	<	<	<	0.0114	<	0.0268	<	.
Manganese	0.182	0.178	0.183	0.19	0.0114	0.0121	0.239	<	0.563	.
Mercury	.	.	.	.	.	.	.	<	<	.
Nickel	<	<	0.0106	0.0106	<	0.0143	<	<	0.0271	.
Strontium	0.177	0.181	0.159	0.165	0.54	0.529	0.208	0.155	0.194	.
Thallium	<	<	<	<	<	<	<	<	<	.
Uranium	0.15	0.14	0.11	0.12	0.0052	0.0052	<	<	0.00054	.
Vanadium	<	<	<	<	<	<	<	<	<	.
Zinc	<	<	<	<	<	<	<	<	<	.

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-686			GW-690	GW-691	GW-692	GW-698		GW-700	
Functional Area	CPT			CPT	CPT	CPT	B8110		B8110	
Date Sampled	06/13/07	10/18/07		10/22/07	10/22/07	10/16/07	06/13/07	10/16/07	10/25/07	10/25/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type			Dup							Dup
Field Measurements										
Time Sampled	10:55	9:40	9:50	9:25	13:55	14:20	9:20	10:30	8:55	8:55
Measuring Point Elev. (ft)	963.76	963.76	963.76	967.36	968.59	964.38	970.09	970.09	960.18	960.18
Depth to Water (ft)	13.26	13.17	13.17	11.11	12.47	9.21	39.06	42.44	19.92	19.92
Groundwater Elevation (ft)	950.50	950.59	950.59	956.25	956.12	955.17	931.03	927.65	940.26	940.26
Conductivity (μmho/cm)	1,033	1,079	1,079	1,211	2,420	614	1,907	2,100	650	650
Dissolved Oxygen (ppm)	0.35	0.38	0.38	1.08	0.14	0.09	0.16	0.52	0.33	0.33
Iron (++)	.	.	.	.	.	.	.	.	.	.
Manganese (++)	.	.	.	.	.	.	.	.	.	.
Oxidation/Reduction (mV)	67	-14	-14	170	207	-158	169	142	135	135
Temperature (degrees C)	21.6	21.2	21.2	18.4	19.5	21.9	19.1	20.3	17.9	17.9
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.
pH	6.6	6.61	6.61	6.88	6.39	7.39	6.92	6.97	6.76	6.76
Miscellaneous Analytes										
Dissolved Solids (mg/L)	700	733	738	1,010	2,230	358	1,280	1,340	394	404
Suspended Solids (mg/L)	<	2	2	<	<	4	3	2	<	<
Turbidity (NTU)	6.61	3	3.46	0.647	0.223	5.43	3.64	1.49	0.433	0.434
Major Ions (mg/L)										
Calcium	170	177	174	256	522	81.3	239	255	115	112
Magnesium	26.1	25.9	25.3	31.5	75.1	17	73.5	79.1	9.2	9.23
Potassium	2.4	2.96	3.01	5.03	9.93	4.3	3.63	4.13	<	<
Sodium	14.5	14.5	14.2	7.72	16.3	14.4	27	30.2	12.7	12.8
Bicarbonate	317	326	320	268	318	164	258	243	256	240
Carbonate	<	<	<	<	<	<	<	<	<	<
Chloride	13.6	13.2	13.4	62.2	33	13	20.9	24.3	11.5	11.4
Fluoride	<	<	<	<	<	1.01	<	<	<	<
Nitrate as N	0.122	0.386	0.366	4.03	1.71	0.0474	163	210	0.215	0.203
Sulfate	210	196	199	382	1,150	114	51.3	46.5	83.6	82.5
Charge balance error (%)	1.0	3.0	2.3	1.5	2.8	0.9	2.1	-2.0	-1.0	0.4
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	0.223	<	<	<	<
Antimony	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.0771	0.0929	0.0924	0.0283	0.0172	0.0504	0.238	0.276	0.0412	0.0415
Beryllium	<	<	<	<	0.00548 Q	0.00075	<	<	<	<
Boron	<	<	<	<	0.127	<	<	<	<	<
Cadmium	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	0.0531	<	<	<	<	<
Copper	<	<	<	<	0.0306	<	<	<	<	<
Iron	0.553	2.98	3.5	<	0.0922	0.761	0.118	0.153	<	<
Lead	<	0.00264	<	<	<	<	<	<	<	0.0007
Lithium	<	<	<	0.0114	0.0427	0.016	<	<	<	<
Manganese	0.914	2.11	2.35	0.00756	14	0.387	0.206	0.192	0.237	0.235
Mercury	<	<	<	<	<	0.00052	0.00028	0.00027	<	<
Nickel	0.0114	0.00522	<	<	0.0376	<	0.0144	<	<	<
Strontium	0.392	0.405	0.395	0.371	0.738	0.222	0.738	0.844	0.159	0.16
Thallium	<	<	<	<	<	<	<	<	<	<
Uranium	0.00097	0.00103	0.00097	<	0.00131	<	0.0011	0.0011	0.00066	0.00069
Vanadium	<	<	<	<	0.0265	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-722-06	GW-722-10	GW-722-14			GW-722-17			GW-722-20		
Functional Area	EXP-J	EXP-J	EXP-J			EXP-J			EXP-J		
Date Sampled	09/13/07	09/17/07	02/28/07	04/05/07	09/18/07	02/28/07	04/05/07	09/18/07	02/28/07	04/04/07	09/17/07
Program	GWPP	GWPP	BJC	BJC	GWPP	BJC	BJC	GWPP	BJC	BJC	GWPP
Sample Type											
Field Measurements											
Time Sampled	8:28	10:18	12:30	9:30	9:44	12:40	10:30	10:48	12:50	15:30	14:54
Measuring Point Elev. (ft)	953.71	953.71	953.71	953.71	953.71	953.71	953.71	953.71	953.71	953.71	953.71
Depth to Water (ft)	56.68	56.40	.	.	56.30	.	.	56.28	.	.	56.11
Groundwater Elevation (ft)	897.03	897.31	.	.	897.41	.	.	897.43	.	.	897.60
Conductivity (µmho/cm)	888	782	692	410	547	343	337	580	313	315	504
Dissolved Oxygen (ppm)	.	.	14.23	12.35	.	13.71	12.38	.	12.12	13.3	.
Iron (++)	.	.	.	.	.	.	.	.	.	.	.
Manganese (++)	.	.	.	.	.	.	.	.	.	.	.
Oxidation/Reduction (mV)	.	.	48	182	.	39	153	.	62	124	.
Temperature (degrees C)	15.1	16.4	16.6	13.5	16.5	16.4	11.9	18	14.2	15.8	18.8
Turbidity (NTU)	.	.	7	3	.	6	3	.	23	4	.
pH	7.1	7.33	7.84	7.37	7.53	7.71	7.62	7.66	7.68	7.42	7.18
Miscellaneous Analytes											
Dissolved Solids (mg/L)	513	441	.	.	294	.	.	301	.	.	273
Suspended Solids (mg/L)	1	<	.	.	<	.	.	<	.	.	<
Turbidity (NTU)	1.95	0.429	.	.	0.856	.	.	1.5	.	.	1.74
Major Ions (mg/L)											
Calcium	17.8	29.2	.	.	61.4	.	.	46.6	.	.	52.7
Magnesium	12.2	19.8	.	.	28.1	.	.	26.3	.	.	28.4
Potassium	4.85	3.94	.	.	2.03	.	.	2.24	.	.	<
Sodium	162	111	.	.	16.2	.	.	34.6	.	.	16.5
Bicarbonate	245	206	.	.	248	.	.	200	.	.	225
Carbonate	<	<	.	.	<	.	.	<	.	.	<
Chloride	90.9	77.4	.	.	9.33	.	.	32.7	.	.	9.13
Fluoride	1.11	0.995	.	.	0.165	.	.	0.654	.	.	0.321
Nitrate as N	<	<	.	.	0.443	.	.	0.0836	.	.	0.253
Sulfate	48.4	55	.	.	16.7	.	.	32.6	.	.	21.1
Charge balance error (%)	3.0	3.3	.	.	4.5	.	.	3.5	.	.	4.2
Trace Metals (mg/L)											
Aluminum	<	<	.	.	<	.	.	<	.	.	<
Antimony	<	<	.	.	<	.	.	<	.	.	<
Arsenic	<	<	.	.	<	.	.	<	.	.	<
Barium	0.0353	0.0575	.	.	0.122	.	.	0.115	.	.	0.0918
Beryllium	<	<	.	.	<	.	.	<	.	.	<
Boron	0.703	0.446	.	.	0.123	.	.	0.148	.	.	0.112
Cadmium	<	<	.	.	<	.	.	<	.	.	<
Chromium	<	<	.	.	<	.	.	<	.	.	<
Cobalt	<	<	.	.	<	.	.	<	.	.	<
Copper	<	<	.	.	<	.	.	<	.	.	<
Iron	0.15	0.124	.	.	<	.	.	0.0623	.	.	0.0802
Lead	0.000765	<	.	.	0.00076	.	.	<	.	.	<
Lithium	0.121	0.0883	.	.	0.0177	.	.	0.0294	.	.	0.015
Manganese	0.00662	<	.	.	<	.	.	<	.	.	<
Mercury	<	<	.	.	<	.	.	<	.	.	<
Nickel	<	<	.	.	<	.	.	<	.	.	<
Strontium	3.73	2.99	.	.	0.74	.	.	1.18	.	.	0.687
Thallium	<	<	.	.	<	.	.	<	.	.	<
Uranium	<	<	.	.	<	.	.	<	.	.	<
Vanadium	<	<	.	.	<	.	.	<	.	.	<
Zinc	0.097	<	.	.	<	.	.	<	.	.	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-722-22			GW-722-26	GW-722-30	GW-722-32		GW-722-33		
Functional Area	EXP-J			EXP-J	EXP-J	EXP-J		EXP-J		
Date Sampled	02/28/07	04/04/07	09/17/07	09/13/07	09/13/07	09/13/07		02/28/07	04/03/07	09/17/07
Program	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC	GWPP
Sample Type							Dup			
Field Measurements										
Time Sampled	13:00	14:40	13:56	10:40	8:38	10:40	14:20	13:10	14:25	9:09
Measuring Point Elev. (ft)	953.71	953.71	953.71	953.71	953.71	953.71	953.71	953.71	953.71	953.71
Depth to Water (ft)	.	.	43.20	47.02	51.00	51.42	51.42	.	.	50.50
Groundwater Elevation (ft)	.	.	910.51	906.69	902.71	902.29	902.29	.	.	903.21
Conductivity (μmho/cm)	339	368	510	451	325	535	535	339	372	508
Dissolved Oxygen (ppm)	16.73	9.78	.	.	.	.	.	16.6	10.24	.
Iron (++)	.	.	.	.	.	.	.	.	.	.
Manganese (++)	.	.	.	.	.	.	.	.	.	.
Oxidation/Reduction (mV)	45	125	.	.	.	.	.	37	179	.
Temperature (degrees C)	16.3	16.3	18.5	17.3	16.2	18.8	18.8	16.1	25	15.3
Turbidity (NTU)	8	7	.	.	.	.	.	11	5	.
pH	7.78	7.22	7.1	7.5	7.36	6.9	6.9	7.52	6.93	6.55
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	277	231	170	309	304	.	.	294
Suspended Solids (mg/L)	.	.	<	1	<	2	1	.	.	<
Turbidity (NTU)	.	.	0.888	2.4	1.3	6.24	4.51	.	.	0.381
Major Ions (mg/L)										
Calcium	.	.	58.6	64.4	41.8	86	88.5	.	.	84.4
Magnesium	.	.	28.1	20.8	15.5	16.7	17.2	.	.	16.3
Potassium	.	.	<	2.5	<	2.31	2.4	.	.	2.42
Sodium	.	.	13.4	2.68	0.841	3.62	3.35	.	.	3.43
Bicarbonate	.	.	244	213	141	253	244	.	.	249
Carbonate	.	.	<	<	<	<	<	.	.	<
Chloride	.	.	5.52	3.65	2.45	3.42	3.32	.	.	3.25
Fluoride	.	.	0.248	1.12	0.175	<	<	.	.	<
Nitrate as N	.	.	0.287	<	0.309	0.928	0.892	.	.	0.831
Sulfate	.	.	17.3	0.7	8.7	11.8	11.4	.	.	11.5
Charge balance error (%)	.	.	3.5	7.0	4.6	3.7	6.8	.	.	3.6
Trace Metals (mg/L)										
Aluminum	.	.	<	<	<	0.274	<	.	.	<
Antimony	.	.	<	<	<	<	<	.	.	<
Arsenic	.	.	<	<	<	<	<	.	.	<
Barium	.	.	0.0989	0.233	0.0505	0.0562	0.0423	.	.	0.0453
Beryllium	.	.	<	<	<	<	<	.	.	<
Boron	.	.	0.106	<	<	<	<	.	.	<
Cadmium	.	.	<	<	<	<	<	.	.	<
Chromium	.	.	<	<	<	<	<	.	.	<
Cobalt	.	.	<	<	<	<	<	.	.	<
Copper	.	.	<	<	<	<	<	.	.	<
Iron	.	.	0.0789	0.29	0.131	0.504	0.178	.	.	0.138
Lead	.	.	0.00129	<	<	0.00199	0.00061	.	.	0.00059
Lithium	.	.	0.016	<	<	<	<	.	.	<
Manganese	.	.	<	0.085	<	0.0108	<	.	.	<
Mercury	.	.	<	<	<	<	<	.	.	<
Nickel	.	.	<	<	<	<	<	.	.	<
Strontium	.	.	0.695	1.27	0.0715	0.106	0.0846	.	.	0.0885
Thallium	.	.	<	<	<	<	<	.	.	<
Uranium	.	.	<	<	0.00061	0.00052	0.000505	.	.	<
Vanadium	.	.	<	<	<	<	<	.	.	<
Zinc	.	.	<	0.0767	<	0.239	0.0503	.	.	0.201

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-733		GW-735		GW-744	GW-747	GW-750	GW-762			
Functional Area	EXP-J		EXP-J		GRIDK1	GRIDK2	EXP-J	GRIDJ3			
Date Sampled	01/04/07	07/09/07	03/08/07		03/15/07	03/15/07	03/07/07	03/01/07		08/06/07	
Program	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC
Sample Type				Dup					Dup		Dup
Field Measurements											
Time Sampled	10:15	14:20	8:25	8:25	9:30	11:00	9:55	10:00	.	14:20	.
Measuring Point Elev. (ft)	959.84	959.84	924.46	924.46	907.43	911.06	919.03	915.56	.	915.56	.
Depth to Water (ft)	57.58	59.81	23.44	23.44	5.89	8.30	12.49	14.12	.	14.08	.
Groundwater Elevation (ft)	902.26	900.03	901.02	901.02	901.54	902.76	906.54	901.44	.	901.48	.
Conductivity (μmho/cm)	210	209	738	738	429	542	518	1,142	.	1,192	.
Dissolved Oxygen (ppm)	7.34	2.01	0.27	0.27	0.53	0.44	0.42	0.53	.	0.82	.
Iron (++)	.	.	.	.	.	.	.	0.02	.	.	.
Manganese (++)	.	.	.	.	.	.	.	0.2	.	.	.
Oxidation/Reduction (mV)	188	130	154	154	-105	-140	19	221	.	21	.
Temperature (degrees C)	9.8	27.2	14	14	13.8	15.9	13.8	16.7	.	21.8	.
Turbidity (NTU)	1	4	.	.	.	.	.	1	.	2	.
pH	7.53	7.81	6.9	6.9	7.57	7.65	7.16	7.14	.	7.38	.
Miscellaneous Analytes											
Dissolved Solids (mg/L)	.	.	403	417	234	276	298	339	373	401	413
Suspended Solids (mg/L)	.	.	<	<	<	<	<	<	<	<	<
Turbidity (NTU)	.	.	0.395	0.403	0.973	0.128	0.753	.	.	.	.
Major Ions (mg/L)											
Calcium	.	.	126	128	36.7	53.2	77.7	77.8	79.4	76.6 J	78.1 J
Magnesium	.	.	9.79	9.89	8.74	10.1	11.7	22.5	22.8	22.8	23.2
Potassium	.	.	2.39	2.46	2.81	3.35	4.7	3.32	3.35	3.36	3.49
Sodium	.	.	3.3	3.34	36.8	36.9	6.5	10.9	11	10.9	10.9
Bicarbonate	.	.	310	316	224	242	235	266	254	248	256
Carbonate	.	.	<	<	<	<	<	<	<	<	<
Chloride	.	.	17.5	16.7	2.45	10.6	5.23	37.2	36.2	37.7	38.2
Fluoride	.	.	<	<	0.278	0.122	<	<	<	0.19	0.18
Nitrate as N	.	.	<	<	0.35	<	<	0.021	<	0.03	0.032
Sulfate	.	.	20.1	20.3	14.5	13.3	14.8	15.4	14.6	13.9	13.9
Charge balance error (%)	.	.	1.3	1.4	-7.3	-2.3	0.9	-3.4	.	-1.1	.
Trace Metals (mg/L)											
Aluminum	.	.	<	<	<	<	<	<	<	<	<
Antimony	.	.	<	<	<	<	<	<	<	<	<
Arsenic	.	.	<	<	<	<	<	<	<	<	<
Barium	.	.	0.329	0.331	0.159	0.247	0.729	0.487	0.501	0.526	0.527
Beryllium	.	.	<	<	<	<	<	<	<	<	<
Boron	.	.	<	<	<	<	0.102	<	<	<	<
Cadmium	.	.	<	<	<	<	<	<	<	<	<
Chromium	.	.	<	<	<	<	<	<	<	<	<
Cobalt	.	.	<	<	<	<	<	<	<	<	<
Copper	.	.	<	<	<	<	<	<	<	0.0226	<
Iron	.	.	<	0.0518	0.176	<	0.12	<	<	<	<
Lead	.	.	<	<	<	<	<	<	<	<	<
Lithium	.	.	<	<	0.0216	0.0313	0.013	0.015	0.0152	0.0153 J	0.0157 J
Manganese	.	.	0.17	0.172	0.0132	0.0907	0.0541	0.048	0.0486	0.0483	0.0483
Mercury	.	.	<	<	<	<	<	.	.	.	.
Nickel	.	.	<	<	<	<	<	<	<	<	<
Strontium	.	.	0.287	0.288	0.641	1.23	0.683	0.69	0.708	0.732	0.738
Thallium	.	.	<	<	<	<	<	<	<	<	<
Uranium	.	.	<	<	<	<	<	<	<	<	<
Vanadium	.	.	<	<	<	<	<	<	<	<	<
Zinc	.	.	<	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-763	GW-765	GW-769		GW-770		GW-775		GW-776	GW-779	
Functional Area	GRIDJ3	GRIDE1	GRIDG3		GRIDG3		GRIDH3		GRIDH3	GRIDF2	
Date Sampled	12/03/07	12/03/07	05/29/07	11/13/07	05/29/07	11/12/07	11/29/07		11/29/07	02/27/07	09/10/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type								Dup			
Field Measurements											
Time Sampled	8:40	14:05	9:05	14:10	10:00	13:30	8:50	8:50	10:05	11:00	8:10
Measuring Point Elev. (ft)	915.03	1,008.54	944.43	944.43	944.72	944.72	931.35	931.35	931.25	963.09	963.09
Depth to Water (ft)	9.25	19.20	11.35	11.29	14.80	14.64	12.95	12.95	13.13	9.65	9.63
Groundwater Elevation (ft)	905.78	989.34	933.08	933.14	929.92	930.08	918.40	918.40	918.12	953.44	953.46
Conductivity (μmho/cm)	805	694	488	513	335	357	582	582	606	453	448
Dissolved Oxygen (ppm)	0.13	0.62	0.27	0.4	4.04	4.7	0.6	0.6	1.64	1.04	0.66
Iron (++)	.	.	.	.	.	.	.	.	.	.	.
Manganese (++)	.	.	.	.	.	.	.	.	.	.	.
Oxidation/Reduction (mV)	-72	109	10.6	36	132	122	99	99	28	79	88
Temperature (degrees C)	19.9	15.4	21.1	20.7	20.5	22	18.8	18.8	18.4	15.2	22.2
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.	.
pH	6.81	7.03	7.11	7.31	7.03	7.29	7.32	7.32	7.14	9.43	9.18
Miscellaneous Analytes											
Dissolved Solids (mg/L)	387	405	299	298	184	201	319	317	326	234	247
Suspended Solids (mg/L)	21	<	3	<	<	<	<	<	<	<	<
Turbidity (NTU)	203	0.545	7.9	0.209	0.908	0.269	0.279	0.278	3.6	0.965	0.806
Major Ions (mg/L)											
Calcium	112	125	81.9	83.6	53.5	60.1	98.7	99	98.2	3.56	3.23
Magnesium	15	13	10.4	9.64	4.51	5.07	8.02	7.91	5.43	2.29	2.11
Potassium	<	<	3.07	2.68	<	2.53	2.68	2.47	2.75	2.64	2.54
Sodium	22.7	10.9	7.18	7	5.9	5.94	5.26	5.12	11.4	96	92
Bicarbonate	276	324	222	215	146	148	209	209	202	144	193
Carbonate	<	<	<	<	<	<	<	<	<	56.8	<
Chloride	84.7	29.1	16.5	16.7	2.45	2.82	31.8	30.7	34.7	7.69	8.48
Fluoride	0.242	<	<	<	0.219	0.214	<	<	<	0.524	0.503
Nitrate as N	<	<	0.309	0.366	0.978	1.32	0.454	0.47	0.989	<	<
Sulfate	<	10.4	20.5	22.1	17.6	18.4	31.7	31.4	35.4	8.04	8.12
Charge balance error (%)	-0.7	1.8	-0.2	0.8	-2.0	2.9	1.0	1.3	0.8	1.7	1.1
Trace Metals (mg/L)											
Aluminum	<	<	0.658	<	<	<	<	<	<	<	<
Antimony	<	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<	<
Barium	0.0588	0.164	0.401	0.356	0.0578	0.0657	0.212	0.206	0.0862	0.216	0.209
Beryllium	<	<	<	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	<	<	0.181	0.176
Cadmium	<	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	0.0303	<	<	<	0.0106	<	<
Cobalt	<	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<	<
Iron	16.2	0.0651	0.612	<	0.103	0.0679	<	<	0.589	<	<
Lead	0.00593	<	0.00072	<	0.0098	0.0114	<	<	0.00255	<	0.00246
Lithium	<	0.0168	0.0163	0.0152	<	<	0.01	0.0111	<	0.0379	0.036
Manganese	0.49	0.299	0.0187	0.00603	<	<	<	<	0.0193	<	<
Mercury	<	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	0.442	<	<
Strontium	0.231	0.179	0.388	0.358	0.0744	0.0833	0.249	0.243	0.165	0.394	0.375
Thallium	<	<	<	<	<	<	<	<	<	<	<
Uranium	<	<	<	0.00052	0.00089	0.00197	<	<	<	<	<
Vanadium	<	<	<	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-781	GW-782	GW-783	GW-791	GW-792	GW-802	GW-816	GW-820		GW-832	
Functional Area	GRIDE3	GRIDE3	GRIDE3	GRIDD2	GRIDD2	FF	EXP-SR	B9201-2		NHP	
Date Sampled	11/27/07	11/27/07	11/28/07	11/12/07	11/12/07	05/01/07	03/07/07	05/30/07	11/20/07	03/05/07	08/15/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	GWPP	GWPP	GWPP	BJC	BJC
Sample Type											
Field Measurements											
Time Sampled	9:40	13:40	9:30	9:05	10:30	9:25	8:50	10:55	8:15	10:30	8:45
Measuring Point Elev. (ft)	947.89	947.73	948.49	992.13	992.74	941.83	898.42	929.57	929.57	906.18	906.18
Depth to Water (ft)	6.57	8.48	10.27	25.05	26.14	6.49	11.94	10.05	9.96	7.09	7.10
Groundwater Elevation (ft)	941.32	939.25	938.22	967.08	966.60	935.34	886.48	919.52	919.61	899.09	899.08
Conductivity (μmho/cm)	437	543	549	468	456	796	512	542	527	257	385
Dissolved Oxygen (ppm)	0.94	0.2	3.35	1.68	1.15	0.78	0.16	0.13	0.2	9.8	7.75
Iron (++)	.	.	.	.	.	.	.	.	.	0.59	.
Manganese (++)	.	.	.	.	.	.	.	.	.	0.3	.
Oxidation/Reduction (mV)	92	57	128	15	163	154	-51	-51	-87	103	121
Temperature (degrees C)	12	18.2	16.3	17.1	18.4	20.1	12.6	20.8	20.3	12.9	20.3
Turbidity (NTU)	.	.	.	.	.	3	.	.	.	176	10
pH	8.57	7.26	7.24	7.4	6.22	7.15	6.66	7.25	7.43	7.33	7.23
Miscellaneous Analytes											
Dissolved Solids (mg/L)	244	293	303	265	309	.	242	313	293	497	259
Suspended Solids (mg/L)	<	<	<	<	1	.	23	<	<	<	17
Turbidity (NTU)	0.203	0.095	1.5	0.351	4.71	.	23.3	0.529	4.46	.	.
Major Ions (mg/L)											
Calcium	8.51	75.4	91.4	64.3	60.7	.	54.7	68.2	67.6	64.4	54.3 J
Magnesium	2.93	15.6	6.06	13.6	5.67	.	17.5	12.3	11.1	14.4	14.5
Potassium	4.82	5.54	<	<	<	.	4.27	2.46	2.51	2.02	2.42
Sodium	80.6	9.39	17.8	6.78	11.3	.	7.32	21.8	21.9	7.7	9.6
Bicarbonate	192	231	190	204	87.7	.	177	187	172	164	130
Carbonate	<	<	<	<	<	.	<	<	<	<	<
Chloride	6.51	15.4	33.8	7.91	36.8	.	24.7	32.5	33.5	12.8	10.9
Fluoride	<	<	<	<	<	.	0.141	0.206	0.217	0.24	0.56
Nitrate as N	0.12	0.111	1.04	<	5.05	.	<	<	<	1.3	1.4
Sulfate	8.65	14.8	26.7	10.5	31	.	13.8	39.3	39	25	32.4
Charge balance error (%)	1.0	2.1	4.0	1.1	2.4	.	0.7	-0.5	0.9	5.3	7.8
Trace Metals (mg/L)											
Aluminum	<	<	<	<	<	.	<	<	<	0.689	0.641
Antimony	<	<	<	<	<	.	<	<	<	<	<
Arsenic	<	<	<	<	<	.	<	<	<	<	<
Barium	0.253	0.509	0.12	0.244	0.117	.	0.0841	0.204	0.198	0.0564	0.054
Beryllium	<	<	<	<	<	.	<	<	<	<	<
Boron	0.528	0.121	<	<	<	.	<	<	<	<	<
Cadmium	<	<	<	<	<	.	<	<	<	<	<
Chromium	<	<	<	<	0.0284	.	<	<	<	<	<
Cobalt	<	<	<	<	<	.	<	<	<	<	<
Copper	<	<	<	<	<	.	<	<	<	<	<
Iron	<	<	0.229	<	0.481	.	18	0.176	0.603	1.07	0.799
Lead	<	0.00217	0.00934	<	0.00274	.	<	0.00398	<	<	<
Lithium	0.0619	0.0187	<	0.0116	<	.	<	<	<	0.0111	0.0146 J
Manganese	<	0.0869	<	0.016	0.0371	.	2.52	0.591	0.609	0.0189	0.0367
Mercury	<	<	<	<	<	.	<	<	<	.	.
Nickel	<	<	0.0767	<	0.159	.	<	<	<	<	<
Strontium	0.479	1.16	0.211	0.387	0.109	.	0.08	0.293	0.268	0.139	0.144
Thallium	<	<	<	<	<	.	<	<	<	<	<
Uranium	<	0.00076	0.00112	<	<	.	<	<	<	0.0065	<
Vanadium	<	<	<	<	<	.	<	<	<	<	<
Zinc	<	<	<	<	<	.	<	<	<	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-954-1		GW-954-2		GW-954-3		GW-956-1			GW-956-2	
Functional Area	Y12		Y12		Y12		Y12			Y12	
Date Sampled	05/23/07	10/30/07	05/23/07	10/30/07	05/23/07	10/30/07	05/22/07		10/29/07	05/22/07	10/29/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type								Dup			
Field Measurements											
Time Sampled	10:16	10:10	10:01	9:35	9:40	8:55	10:20	10:20	11:30	9:58	10:50
Measuring Point Elev. (ft)	988.27	988.27	988.27	988.27	988.27	988.27	940.00	940.00	940.00	940.00	940.00
Depth to Water (ft)	20.95	23.82	26.35	23.47	24.56	29.22	16.55	16.55	19.43	36.69	11.19
Groundwater Elevation (ft)	967.32	964.45	961.92	964.80	963.71	959.05	923.45	923.45	920.57	903.31	928.81
Conductivity (μmho/cm)	532	544	537	555	773	786	747	747	720	510	496
Dissolved Oxygen (ppm)	0.81	0.75	0.62	0.92	0.59	1.46	0.79	0.79	0.6	0.84	0.57
Iron (++)	.	.	.	.	.	.	.	.	.	.	.
Manganese (++)	.	.	.	.	.	.	.	.	.	.	.
Oxidation/Reduction (mV)	-45	-150	-83	-103	-31	-73	-160	-160	-109	35	-124
Temperature (degrees C)	20	16.7	20.2	18	21.2	15.4	18	18	17.1	18.2	16.9
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.	.
pH	8.7	8.95	7.68	7.74	7.05	7.36	8.86	8.86	9.13	8.37	8.64
Miscellaneous Analytes											
Dissolved Solids (mg/L)	322	317	307	304	450	432	438	433	429	290	290
Suspended Solids (mg/L)	8	5	2	<	2	7	22	34	4	2	4
Turbidity (NTU)	6.24	5.6	2.43	2.85	6.31	3.41	5.6	6.54	4.54	7.52	12.8
Major Ions (mg/L)											
Calcium	2.25	2.33	32.1	32.4	109	111	1.63	1.69	1.7	5.61	5.77
Magnesium	1.3	1.29	8.65	8.46	16.4	16.3	0.919	1.02	0.949	2.45	2.5
Potassium	<	<	3.11	3.51	2.92	3.1	2.66	3.03	3.12	3.97	4.53
Sodium	123	127	78	78.5	33.2	35.5	167	177	179	104	111
Bicarbonate	263	244	260	239	342	308	348	348	312	220	209
Carbonate	<	<	<	<	<	<	<	<	<	<	<
Chloride	3	2.97	11.7	10.7	31.7	32	16.5	15.6	16.8	21	19.2
Fluoride	0.612	0.522	0.223	0.201	0.123	0.115	2.38	2.46	2.26	0.764	0.643
Nitrate as N	<	<	<	<	0.0407	<	<	<	<	<	<
Sulfate	15.4	14.1	12.8	11.6	31.3	27.3	14.2	14.2	12.8	11.8	10.9
Charge balance error (%)	-1.1	4.1	-0.2	4.4	-0.5	5.4	-2.3	0.8	6.1	-1.6	4.4
Trace Metals (mg/L)											
Aluminum	0.765	0.852	<	<	<	0.218	0.467	1.03	0.799	0.465	1.01
Antimony	<	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<	<
Barium	0.0997	0.101	0.234	0.235	0.184	0.183	0.041	0.0441	0.0468	0.132	0.14
Beryllium	<	<	<	<	<	<	<	<	<	<	<
Boron	0.168	0.17	0.156	0.156	<	<	0.734	0.779	0.76	0.393	0.408
Cadmium	<	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<	<
Iron	0.243	0.237	0.169	0.185	0.171	0.175	0.25	0.377	0.299	0.227	0.415
Lead	<	<	<	<	<	<	0.00058	0.00082	<	<	0.0121
Lithium	0.0389	0.0416	0.0386	0.0404	0.0316	0.0337	0.0813	0.0852	0.0902	0.0631	0.0685
Manganese	<	<	0.0388	0.0391	0.318	0.297	0.00625	0.00663	0.00582	<	<
Mercury	<	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	0.00524	<	<	<	<	<
Strontium	0.173	0.187	1.14	1.14	0.858	0.892	0.105	0.112	0.112	0.274	0.284
Thallium	<	<	<	<	<	<	<	<	<	<	<
Uranium	<	<	<	<	<	<	<	<	<	<	<
Vanadium	<	<	<	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-956-3		GW-956-4		GW-959	GW-960		GHK2.51WSW	NPR07.0SW
Functional Area	Y12		Y12		B9201-2	GRIDF2		EXP-SW	EXP-SW
Date Sampled	05/22/07	10/29/07	05/22/07	10/29/07	11/20/07	02/28/07	09/10/07	11/06/07	11/06/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type									
Field Measurements									
Time Sampled	10:10	10:46	9:35	10:05	9:35	8:45	10:25	10:10	14:40
Measuring Point Elev. (ft)	940.00	940.00	940.00	940.00	927.69	963.26	963.26	.	.
Depth to Water (ft)	79.85	16.6	99.99	15.51	2.80	13.34	13.59	.	.
Groundwater Elevation (ft)	860.15	923.40	840.01	924.49	924.89	949.92	949.67	.	.
Conductivity (μmho/cm)	495	478	446	431	658	800	758	325	350
Dissolved Oxygen (ppm)	0.77	0.61	1.56	0.99	0.63	0.62	0.6	5.71	5.43
Iron (++)	.	.	.	.	.	.	.	.	.
Manganese (++)	.	.	.	.	.	.	.	.	.
Oxidation/Reduction (mV)	-68	-87	-67	-72	117	44	-58	151	117.4
Temperature (degrees C)	18.2	17.3	18.3	16.7	16.2	12.8	22.9	9.9	9.5
Turbidity (NTU)	.	.	.	.	.	.	.	.	.
pH	7.7	7.78	7.55	7.62	7.17	7.03	7.06	6.96	7.03
Miscellaneous Analytes									
Dissolved Solids (mg/L)	265	259	248	241	403	460	499	168	140
Suspended Solids (mg/L)	4	1	14	16	<	1	3	<	31
Turbidity (NTU)	3.18	2.23	0.927	5.08	2.29	19.6	13	2.88	1.63
Major Ions (mg/L)									
Calcium	42.2	43.2	62.7	65.5	96	108	113	35.3	25.1
Magnesium	16.1	15.7	8.85	8.99	9.74	19.9	19	11.8	13.7
Potassium	4.83	5.08	2.29	2.86	3.54	3.28	3.22	3.18	3.83
Sodium	33.9	31.3	8.87	8.72	25.7	24.8	26.3	2.68	5.65
Bicarbonate	197	187	189	181	181	286	259	107	104
Carbonate	<	<	<	<	<	<	<	<	<
Chloride	22.7	21.5	16	14.2	5.45	34.2	26.2	1.06	1.18
Fluoride	0.213	0.172	<	<	0.277	<	<	<	<
Nitrate as N	<	<	<	<	0.617	0.0565	<	<	<
Sulfate	19.1	17.7	14.5	13.2	129	57.8	88.5	35.6	21.1
Charge balance error (%)	0.4	2.2	-2.6	1.9	2.1	1.9	4.1	0.3	3.3
Trace Metals (mg/L)									
Aluminum	<	<	<	<	<	<	<	<	0.357
Antimony	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<
Barium	0.425	0.426	0.409	0.427	0.116	0.191	0.104	0.0622	0.0846
Beryllium	<	<	<	<	<	<	<	<	<
Boron	0.19	0.178	<	<	<	<	<	<	<
Cadmium	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<
Iron	0.212	0.224	0.176	0.201	0.0747	1.47	1.62	0.253	0.326
Lead	0.0263	<	<	<	0.00173	<	0.00191	0.0016	0.000695
Lithium	0.0311	0.0343	0.0166	0.0183	<	0.0108	0.0105	<	0.0102
Manganese	0.0205	0.017	0.0663	0.0687	0.48	0.291	0.376	0.0228	0.0711
Mercury	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<
Strontium	1.03	1.02	0.333	0.342	0.244	1.87	1.73	0.136	0.135
Thallium	<	<	<	<	<	<	<	<	<
Uranium	<	<	<	<	0.00093	<	<	<	0.000625
Vanadium	<	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	NPR12.0SW		NPR23.0SW	200A6		SCR7.1SP	SCR7.8SP	STATION 8	
Functional Area	EXP-SW		EXP-SW	EXP-SW		EXP-SW	EXP-SW	EXP-SW	
Date Sampled	11/06/07		11/06/07	01/16/07	07/11/07	01/18/07	01/18/07	01/16/07	07/11/07
Program	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup							
Field Measurements									
Time Sampled	13:50	13:50	13:00	14:05	14:10	13:25	13:35	14:20	14:25
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.	.	.
Conductivity (μmho/cm)	231	231	296	415	348	547	461	340	233
Dissolved Oxygen (ppm)	4.92	4.92	4.95	11.53	10.6	18.63	19.3	13.76	9.21
Iron (++)	.	.	.	.	.	0.01	0.01	.	.
Manganese (++)	.	.	.	.	.	0.2	0.1	.	.
Oxidation/Reduction (mV)	16	16	130	57	83.3	143	120	57.2	91.2
Temperature (degrees C)	8.9	8.9	10.7	17.3	26.96	9.88	10.21	12.2	24.73
Turbidity (NTU)	.	.	.	1.95	26	16.1	3.1	3.68	24
pH	6.95	6.95	6.85	6.98	7.83	6.95	7.12	7.29	7.78
Miscellaneous Analytes									
Dissolved Solids (mg/L)	121	116	132	243	220	193	223	211	159
Suspended Solids (mg/L)	24	18	<	<	17	6	<	<	20
Turbidity (NTU)	4.41	4.4	2.12	.	.	.	.	.	.
Major Ions (mg/L)									
Calcium	18	18.2	26.6	51.9	47	.	.	41	29.1
Magnesium	9.82	10	9.81	11.9	11.2	.	.	11.7	7.64
Potassium	3.46	3.54	3.3	2.91	3.02	.	.	2.22	1.8
Sodium	5.66	5.73	3.51	9.74	8.62	.	.	8.83	5.86
Bicarbonate	94.2	92.6	87.6	.	.	.	.	.	.
Carbonate	<	<	<	.	.	.	.	.	.
Chloride	0.97	1.01	0.87	.	.	.	.	.	.
Fluoride	<	<	<	.	.	.	.	.	.
Nitrate as N	<	<	<	.	.	.	.	.	.
Sulfate	10.6	10.8	26.4	.	.	.	.	.	.
Charge balance error (%)	-2.2	-0.8	1.0	.	.	.	.	.	.
Trace Metals (mg/L)									
Aluminum	0.596	0.641	<	<	0.265	.	.	<	0.424
Antimony	<	<	<	<	<	.	.	<	<
Arsenic	<	<	<	<	<	.	.	<	<
Barium	0.0883	0.0794	0.066	0.053	0.0515	.	.	0.0401	0.036
Beryllium	<	<	<	<	<	.	.	<	<
Boron	<	<	<	0.479	<	.	.	0.125	<
Cadmium	<	<	<	<	<	.	.	<	<
Chromium	<	<	<	<	<	.	.	<	<
Cobalt	<	<	<	<	<	.	.	<	<
Copper	<	<	<	<	<	.	.	<	<
Iron	1.15	1.14	0.305	0.256	0.475	.	.	0.202	0.78
Lead	<	<	0.00071	<	0.0033	.	.	<	0.0029
Lithium	<	<	<	0.159	0.0595	.	.	0.0405	0.0146
Manganese	0.4	0.195	0.0323	0.0582	0.0414	.	.	0.0495	0.108
Mercury	<	<	<	.	.	.	.	.	0.000383
Nickel	<	<	<	<	0.0893	.	.	<	<
Strontium	0.0883	0.0892	0.0887	0.167	0.157	.	.	0.142	0.0979
Thallium	<	<	<	<	<	.	.	<	<
Uranium	<	<	<	0.094	0.027	.	.	0.023	0.009
Vanadium	<	<	<	<	<	.	.	<	<
Zinc	<	<	<	<	0.156	.	.	<	0.058

APPENDIX E.2

VOLATILE ORGANIC COMPOUNDS

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	55-1A	55-2A		55-2B		55-2C	55-3A		55-3B	
Functional Area	GRIDB2	GRIDB3		GRIDB3		GRIDB3	B9201-5		B9201-5	
Date Sampled	06/11/07	02/20/07	08/23/07	02/20/07	08/23/07	02/20/07	02/21/07	08/22/07	02/21/07	08/22/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type										
Chloroethenes (μg/L)										
Tetrachloroethene	<	250	190	680	480	520	22,000	13,000	97,000	76,000
Trichloroethene	<	110	110	230	210	220	1,100	1,100	8,600	6,800
cis-1,2-Dichloroethene	<	310	410	700	630	760	1,100	1,000	1,400	2,200
trans-1,2-Dichloroethene	<	2 J	5 J	8	8	8	19	19	80	69
1,1-Dichloroethene	<	6	8	18	17	20	23	24	160	190
Vinyl chloride	<	2 J	11	14	16	13	53	37	380	400
Chloroethanes (μg/L)										
1,1,1,2-Tetrachloroethane	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	2 J	2 J	<	<	2 J	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	7	9	14	13	19	4 J	5 J	50	45
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	<	<
Chloromethanes (μg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (μg/L)										
Benzene	<	<	<	<	<	<	<	<	2 J	2 J
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	10	3 J
Total Xylene	<	<	<	<	<	<	<	<	<	3 J
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (μg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	<	170	130	390	350	270	31	35	5	<
1,2-Dichloropropane	<	<	<	<	<	<	<	2 J	<	4 J
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	<	2 J
2-Butanone	<	<	<	<	<	<	<	<	<	32 Q
2-Hexanone	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	12	<	10	<	<	5	2 J
Ethanol	<	<	<	<	<	<	<	<	<	<
Natural Attenuation (μg/L)										
Ethane	.	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	55-3C		56-1A		56-2A		56-2B	56-2C	56-3A		
Functional Area	B9201-5		Y12		GRIDC3		GRIDC3	GRIDC3	Y12		
Date Sampled	02/21/07	08/27/07	06/07/07	10/15/07	03/01/07		03/05/07	03/05/07	02/22/07		08/30/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type						Dup				Dup	
Chloroethenes (µg/L)											
Tetrachloroethene	15,000	27,000	<	<	6	6	900	510	50	45	47
Trichloroethene	1,700	1,500	<	<	<	<	58	410	4 J	4 J	6
cis-1,2-Dichloroethene	1,600	1,900	<	<	<	<	76	950	7	7	8
trans-1,2-Dichloroethene	31	35	<	<	<	<	<	9	<	<	<
1,1-Dichloroethene	58	43	<	<	<	<	<	16	<	<	<
Vinyl chloride	210 J	190	<	<	<	<	<	40	<	<	<
Chloroethanes (µg/L)											
1,1,1,2-Tetrachloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	2 J	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	8	8	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	<	.	.	.
Chloromethanes (µg/L)											
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	6	6	<	<	<	<	<	<	1 J
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)											
Benzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)											
1,1,2-Trichloro-1,2,2-trifluoroethane	21	38	<	<	<	<	5	<	<	<	<
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	<	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	<	<	<	<	<
Ethanol	<	<	<	<	<	<	<	<	<	<	<
Natural Attenuation (µg/L)											
Ethane	.	.	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	56-3B		56-3C		56-4A		56-6A			60-1A	
Functional Area	Y12		Y12		Y12		Y12			Y12	
Date Sampled	02/22/07	09/04/07	02/22/07	09/05/07	02/26/07	09/05/07	02/26/07	09/06/07		05/30/07	11/19/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type									Dup		
Chloroethenes (µg/L)											
Tetrachloroethene	220	260	620	500	<	2 J	<	<	<	<	<
Trichloroethene	17	17	41	37	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	25	29	73	72	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)											
1,1,1,2-Tetrachloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	1 J	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	6 J	<	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)											
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<	<
Chloroform	<	2 J	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)											
Benzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)											
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	<	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	20 FP	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	<	<	<	<	<
Ethanol	<	<	<	<	<	<	<	<	<	<	<
Natural Attenuation (µg/L)											
Ethane	.	.	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-105	GW-106	GW-108	GW-108	GW-109	GW-151		GW-153	GW-154	
Functional Area	S3	S3	S3	S3	S3	NHP		NHP	NHP	
Date Sampled	06/14/07	06/18/07	01/04/07	07/10/07	06/20/07	03/01/07	08/01/07	03/08/07	03/05/07	08/15/07
Program	GWPP	GWPP	BJC	BJC	GWPP	BJC	BJC	GWPP	BJC	BJC
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	4 J	4	99	660 D	580 D	2 J	<	<
Trichloroethene	<	<	4 J	3	2 J	110 D	91 D	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	78 D	44 DJ	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	1 J	<	<	<	1	<	<	<
Vinyl chloride	<	<	<	<	<	<	0.8 J	<	<	<
Chloroethanes (µg/L)										
1,1,1,2-Tetrachloroethane	<	<	.	.	<	.	.	<	.	.
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	1,100 D	930 D	65	<	<
Chloroform	<	<	34	35	8	78 D	51 D	3 J	<	<
Methylene chloride	<	<	50	48	12	83 BD	<	<	<	<
Chloromethane	<	<	8 J	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	1 J	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	1 J	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	.	.	3 J	.	.	<	.	.
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	.	.	<	.	.	<	.	.
2-Butanone	<	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	1 J	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	62 JBD	<	<	2 JB	<
Bromoform	<	<	5 J	5 J	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	2	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	.	.	<	.	.	<	.	.
Ethanol	<	<	.	.	<	.	.	<	.	.
Natural Attenuation (µg/L)										
Ethane	.	.	.	.	.	<	<	.	<	<
Ethylene	.	.	.	.	.	<	<	.	<	<
Methane	.	.	.	.	.	88	120 B	.	15	18 B

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-169		GW-170				GW-171	GW-172	GW-192	GW-204
Functional Area	EXP-UV		EXP-UV				EXP-UV	EXP-UV	B4	T0134
Date Sampled	03/01/07	08/02/07	03/01/07		08/02/07		03/07/07	03/07/07	06/11/07	11/13/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP
Sample Type				Dup		Dup				
Chloroethenes (μg/L)										
Tetrachloroethene	2 J	1	2 J	2 J	1	1	<	<	2 J	<
Trichloroethene	<	<	1 J	2 J	1	1	<	<	4 J	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	25	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (μg/L)										
1,1,1,2-Tetrachloroethane	.	.	.	.	.	.	.	.	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (μg/L)										
Carbon tetrachloride	<	<	4 J	5 J	3	3	<	<	<	<
Chloroform	<	<	2 J	2 J	2	2	<	<	<	<
Methylene chloride	1 JB	<	2 JB	2 JB	<	<	2 BJ	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (μg/L)										
Benzene	<	<	2 J	2 J	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (μg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.	<	<
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	.	.	.	.	.	.	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	3 JB	<	1 J	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	7	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	.	.	.	.	.	.	.	.	<	<
Ethanol	.	.	.	.	.	.	.	.	<	<
Natural Attenuation (μg/L)										
Ethane	.	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-219	GW-220		GW-223		GW-230	GW-240	GW-251	GW-253
Functional Area	**UOV**	**NHP**		**NHP**		**EXP-UV**	**NHP**	**S2**	**S2**
Date Sampled	**11/28/07**	**06/04/07**	**11/20/07**	**03/06/07**	**08/06/07**	**03/07/07**	**03/08/07**	**06/25/07**	**03/08/07**
Program	**GWPP**	**GWPP**	**GWPP**	**BJC**	**BJC**	**BJC**	**GWPP**	**GWPP**	**BJC**
Sample Type									
Chloroethenes (μg/L)									
Tetrachloroethene	<	420	650	42	25	<	<	100	490 D
Trichloroethene	<	89	130	15	11	<	<	47	260 D
cis-1,2-Dichloroethene	<	44	63	72	66 D	4 J	<	4 J	240 D
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	2 J	<	<	<	<	<	7 JD
Vinyl chloride	<	<	<	5	5	1 J	<	<	100 D
Chloroethanes (μg/L)									
1,1,1,2-Tetrachloroethane	<	<	<	.	.	.	<	<	.
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.
Chloromethanes (μg/L)									
Carbon tetrachloride	<	800	1,100	<	<	<	5 J	<	21 JD
Chloroform	<	57	78	<	<	<	1 J	8	31 D
Methylene chloride	<	<	<	<	<	<	<	<	19 JBD
Chloromethane	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (μg/L)									
Benzene	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<
Miscellaneous (μg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	.	.	.	<	<	.
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	.	.	.	<	<	.
2-Butanone	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	2 J	<	2 J	<	<	14 JBD
Bromoform	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	1 J	<	<	<
Dichlorodifluoromethane	<	<	<	.	.	.	<	<	.
Ethanol	<	<	<	.	.	.	<	<	.
Natural Attenuation (μg/L)									
Ethane	.	.	.	<	<	.	.	.	1.4 J
Ethylene	.	.	.	<	<	.	.	.	<
Methane	.	.	.	7.5	73 B	.	.	.	8.9

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-265			GW-269		GW-270		GW-272	GW-273	GW-274
Functional Area	SY			SY		SY		SY	SY	SY
Date Sampled	06/05/07		10/17/07	06/05/07	10/17/07	06/06/07		03/14/07	06/06/07	03/13/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type		Dup					Dup			
Chloroethenes (µg/L)										
Tetrachloroethene	25	25	22	24	14	<	<	<	<	1,700
Trichloroethene	4 J	4 J	3 J	5	3 J	<	<	<	<	11
cis-1,2-Dichloroethene	1 J	1 J	<	66	41	<	<	<	<	25
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	160	130	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	2 J
Chloroethanes (µg/L)										
1,1,1,2-Tetrachloroethane	<	<	<	<	<	<	<	<	<	2 J
1,1,1-Trichloroethane	<	<	<	16	8	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	6	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	2 J	4 J	2 J	<	<	<	<	19
Methylene chloride	<	<	<	<	<	<	<	<	<	31
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	180
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	33	35	<	<	<	<	<
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	7
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	<	<	<	<
Ethanol	<	<	<	<	<	<	<	<	<	<
Natural Attenuation (µg/L)										
Ethane	.	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-275	GW-281	GW-332	GW-336	GW-337	GW-380		GW-381	GW-382	
Functional Area	SY	FF	WCPA	WCPA	WCPA	NHP		NHP	NHP	
Date Sampled	03/13/07	05/01/07	03/06/07	03/06/07	03/06/07	03/05/07	08/15/07	12/04/07	03/06/07	08/02/07
Program	GWPP	BJC	GWPP	GWPP	GWPP	BJC	BJC	GWPP	BJC	BJC
Sample Type										
Chloroethenes (μg/L)										
Tetrachloroethene	<	<	1,100	270	520	<	<	<	13 JD	23
Trichloroethene	<	<	200	220	430	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	1,100	1,000	1,600	<	<	1 J	7 JD	<
trans-1,2-Dichloroethene	<	<	10	11	19	<	<	<	<	<
1,1-Dichloroethene	<	<	25	66	72	<	<	<	<	<
Vinyl chloride	<	<	13	17	15	<	<	<	<	<
Chloroethanes (μg/L)										
1,1,1,2-Tetrachloroethane	<	.	<	<	<	.	.	<	.	.
1,1,1-Trichloroethane	<	<	7	14	59	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	25	42	57	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (μg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	5	430 D	250
Chloroform	<	<	<	<	<	<	<	<	140 D	81
Methylene chloride	<	1 BJ	<	<	<	<	<	<	6 JD	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (μg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (μg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	<	.	3,600	790	1,000	.	.	<	.	.
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	.	<	<	<	.	.	<	.	.
2-Butanone	<	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	1 BJ	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	.	48	8	7	.	.	<	.	.
Ethanol	<	.	<	<	<	.	.	<	.	.
Natural Attenuation (μg/L)										
Ethane	.	.	.	.	.	<	<	.	<	<
Ethylene	.	.	.	.	.	<	<	.	<	<
Methane	.	.	.	.	.	<	<	.	170	590 B

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-383			GW-505	GW-605				GW-606	
Functional Area	NHP			RG	EXP-I				EXP-I	
Date Sampled	06/20/07	11/19/07		06/18/07	01/03/07		07/09/07		01/03/07	07/09/07
Program	GWPP	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type			Dup			Dup		Dup		
Chloroethenes (µg/L)										
Tetrachloroethene	430	330	350	<	71	68	110	110	5 J	5
Trichloroethene	180	160	180	<	72	70	120	120	<	<
cis-1,2-Dichloroethene	220	230	240	<	97	95	180	180	<	<
trans-1,2-Dichloroethene	1 J	2 J	2 J	<	<	<	<	<	<	<
1,1-Dichloroethene	3 J	3 J	4 J	<	<	<	<	<	<	<
Vinyl chloride	2	3	3	<	<	<	2	2	<	<
Chloroethanes (µg/L)										
1,1,1,2-Tetrachloroethane	<	<	<	<	.	.	.	.	.	.
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	63	60	110	110	39	39
Chloroform	<	<	<	<	13	13	22	23	94	70
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	<	.	.	.	.	.	.
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	.	.	.	.	.	.
2-Butanone	<	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	.	.	.	.	.	.
Ethanol	<	<	<	<	.	.	.	.	.	.
Natural Attenuation (µg/L)										
Ethane	.	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-618	GW-620	GW-656	GW-658	GW-686			GW-690	GW-691	GW-692
Functional Area	EXP-E	FTF	T0134	FF	CPT			CPT	CPT	CPT
Date Sampled	03/08/07	06/19/07	11/13/07	05/01/07	06/13/07	10/18/07		10/22/07	10/22/07	10/16/07
Program	BJC	GWPP	GWPP	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type							Dup			
Chloroethenes (μg/L)										
Tetrachloroethene	6	<	36	<	<	<	<	45	2,600	1 J
Trichloroethene	5	<	2,600	<	<	<	<	4 J	18	3 J
cis-1,2-Dichloroethene	9	<	140	<	9	33	31	7	23	24
trans-1,2-Dichloroethene	<	<	18	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	180	<	<	<	<	<	<	<
Vinyl chloride	<	<	5	<	<	2	2	<	<	<
Chloroethanes (μg/L)										
1,1,1,2-Tetrachloroethane	.	<	<	.	<	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	530 D	<	<	<	<	<	<
1,1-Dichloroethane	<	<	12	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (μg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	2 J
Methylene chloride	<	<	<	24 B	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (μg/L)										
Benzene	<	<	<	8,100 D	<	<	<	<	<	<
Ethylbenzene	<	<	<	1,000 D	<	<	<	<	<	<
Toluene	<	<	<	3,300 D	<	<	<	<	<	<
Total Xylene	<	<	<	8,000 D	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (μg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	.	<	<	.	<	<	<	<	<	<
1,2-Dichloropropane	<	<	3 J	11	<	<	<	<	<	<
1,4-Dichlorobenzene	.	<	<	.	<	<	<	<	<	<
2-Butanone	<	<	<	15 B	<	<	<	<	<	<
2-Hexanone	<	<	<	120 E	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	230 E	<	<	<	<	<	<
Acetone	3 JB	<	<	31 B	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	.	<	<	.	<	<	<	<	<	<
Ethanol	.	<	<	.	<	<	<	<	<	<
Natural Attenuation (μg/L)										
Ethane	<	.	.	.	.	.	.	.	.	.
Ethylene	<	.	.	.	.	.	.	.	.	.
Methane	25	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-698		GW-700		GW-722-06	GW-722-10	GW-722-14		
Functional Area	B8110		B8110		EXP-J	EXP-J	EXP-J		
Date Sampled	06/13/07	10/16/07	10/25/07		09/13/07	09/17/07	02/28/07	04/05/07	09/18/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC	GWPP
Sample Type				Dup					
Chloroethenes (µg/L)									
Tetrachloroethene	150	160	62	62	<	<	4 J	3	3 J
Trichloroethene	500	610	13	13	<	<	1 J	1 J	1 J
cis-1,2-Dichloroethene	37	33	47	46	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)									
1,1,1,2-Tetrachloroethane	<	<	<	<	<	<	.	.	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)									
Carbon tetrachloride	7	9	<	<	<	<	22	26	20
Chloroform	20	25	<	<	<	<	4 J	4 J	2 J
Methylene chloride	<	<	<	<	<	<	2 J	1 J	<
Chloromethane	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)									
Benzene	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	22	29	2 J	2 J	<	<	.	.	<
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	.	.	<
2-Butanone	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	5 J	6 JB	<
Bromoform	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	.	.	<
Ethanol	<	<	<	<	<	<	.	.	<
Natural Attenuation (µg/L)									
Ethane	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-722-17			GW-722-20			GW-722-22			GW-722-26
Functional Area	EXP-J			EXP-J			EXP-J			EXP-J
Date Sampled	02/28/07	04/05/07	09/18/07	02/28/07	04/04/07	09/17/07	02/28/07	04/04/07	09/17/07	09/13/07
Program	BJC	BJC	GWPP	BJC	BJC	GWPP	BJC	BJC	GWPP	GWPP
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethene	7	5	6	12	11	8	6	5	4 J	<
Trichloroethene	1 J	1 J	2 J	2 J	2	2 J	1 J	2 J	1 J	<
cis-1,2-Dichloroethene	<	<	<	1 J	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,1,2-Tetrachloroethane	.	.	<	.	.	<	.	.	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	30	33	47	67	71	61	14	13	15	<
Chloroform	9	8	9	13	13	11	2 J	1 J	2 J	<
Methylene chloride	1 J	<	<	2 J	<	<	1 J	2 J	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	1 J
Ethylbenzene	<	<	<	<	<	<	<	<	<	4 J
Toluene	<	<	<	<	<	<	<	<	<	4 J
Total Xylene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	3 J
Miscellaneous (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	<	.	.	<	.	.	<	<
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	.	.	<	.	.	<	.	.	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	1 J	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	2 J	<	<	<	<
Acetone	8 J	5 JB	<	8 J	5 JB	<	4 J	8 JB	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	.	.	<	.	.	<	.	.	<	<
Ethanol	.	.	<	.	.	150 J	.	.	<	<
Natural Attenuation (µg/L)										
Ethane	.	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-722-30	GW-722-32		GW-722-33			GW-733		GW-735	
Functional Area	EXP-J	EXP-J		EXP-J			EXP-J		EXP-J	
Date Sampled	09/13/07	09/13/07		02/28/07	04/03/07	09/17/07	01/04/07	07/09/07	03/08/07	
Program	GWPP	GWPP	GWPP	BJC	BJC	GWPP	BJC	BJC	GWPP	GWPP
Sample Type			Dup							Dup
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,1,2-Tetrachloroethane	<	<	<	.	.	<	.	.	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	4 J	4	<	<
Chloroform	<	<	<	1 J	<	1 J	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	.	.	<	.	.	<	<
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	.	.	<	.	.	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	1 J	10 JB	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	.	.	<	.	.	<	<
Ethanol	<	<	<	.	.	<	.	.	<	<
Natural Attenuation (µg/L)										
Ethane	.	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-744	GW-747	GW-750	GW-762				GW-763	GW-765
Functional Area	GRIDK1	GRIDK2	EXP-J	GRIDJ3				GRIDJ3	GRIDE1
Date Sampled	03/15/07	03/15/07	03/07/07	03/01/07		08/06/07		12/03/07	12/03/07
Program	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	GWPP	GWPP
Sample Type					Dup		Dup		
Chloroethenes (µg/L)									
Tetrachloroethene	<	<	<	2,300 D	2,300 D	2,500 D	2,500 D	<	<
Trichloroethene	<	<	<	130 D	130 D	110 D	110 D	<	<
cis-1,2-Dichloroethene	<	<	<	67 JD	63 JD	31 DJ	32 DJ	3 J	<
trans-1,2-Dichloroethene	<	<	<	<	<	2	2	<	<
1,1-Dichloroethene	<	<	<	62 JD	47 JD	39 DJ	34 DJ	<	<
Vinyl chloride	<	<	<	<	<	5	5	<	<
Chloroethanes (µg/L)									
1,1,1,2-Tetrachloroethane	<	<	<	.	.	.	.	<	<
1,1,1-Trichloroethane	<	<	<	<	<	2	2	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	12	12	<	<
Chloroethane	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	170 BD	160 BD	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)									
Benzene	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	.	.	.	.	<	<
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	.	.	.	.	<	<
2-Butanone	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	170 BJD	220 BD	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	.	.	.	.	<	<
Ethanol	<	<	<	.	.	.	.	<	<
Natural Attenuation (µg/L)									
Ethane	.	.	.	<	<	<	<	.	.
Ethylene	.	.	.	1 J	<	1.1 J	<	.	.
Methane	.	.	.	20	21	22 B	23 B	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-769		GW-770		GW-775		GW-776	GW-779		GW-781
Functional Area	GRIDG3		GRIDG3		GRIDH3		GRIDH3	GRIDF2		GRIDE3
Date Sampled	05/29/07	11/13/07	05/29/07	11/12/07	11/29/07		11/29/07	02/27/07	09/10/07	11/27/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type						Dup				
Chloroethenes (μg/L)										
Tetrachloroethene	16	22	<	<	<	<	<	<	<	1 J
Trichloroethene	4 J	6	<	<	3 J	3 J	2 J	<	<	<
cis-1,2-Dichloroethene	3 J	4 J	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	1 J	2 J	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (μg/L)										
1,1,1,2-Tetrachloroethane	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	1 J	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.	.
Chloromethanes (μg/L)										
Carbon tetrachloride	87	170	22	25	<	<	<	<	<	<
Chloroform	3 J	5 J	2 J	3 J	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (μg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (μg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	1 J	2 J	<	<	<	<	<	<	<	<
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	<	<	<	<
Ethanol	<	<	<	<	<	<	<	<	<	<
Natural Attenuation (μg/L)										
Ethane	.	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-782	GW-783	GW-791	GW-792	GW-802	GW-816	GW-820		GW-832	
Functional Area	GRIDE3	GRIDE3	GRIDD2	GRIDD2	FF	EXP-SR	B9201-2		NHP	
Date Sampled	11/27/07	11/28/07	11/12/07	11/12/07	05/01/07	03/07/07	05/30/07	11/20/07	03/05/07	08/15/07
Program	GWPP	GWPP	GWPP	GWPP	BJC	GWPP	GWPP	GWPP	BJC	BJC
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethene	92	11	30	3 J	<	<	3,400	2,000	7	2
Trichloroethene	45	6	<	<	<	<	800	460	1 J	0.3 J
cis-1,2-Dichloroethene	25	6	<	<	<	<	1,200	910	1 J	<
trans-1,2-Dichloroethene	1 J	2 J	<	<	<	<	6	6	<	<
1,1-Dichloroethene	46	5	<	<	<	<	5 J	5 J	<	<
Vinyl chloride	<	<	<	<	<	<	71	81	<	<
Chloroethanes (µg/L)										
1,1,1,2-Tetrachloroethane	<	<	<	<	.	<	<	<	.	.
1,1,1-Trichloroethane	3 J	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	92	13	<	<	<	<	<	<	<	<
Chloroethane	13	<	<	<	<	<	<	<	<	<
1,4-Dioxane	<	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	10	3
Chloroform	<	<	<	<	<	<	<	<	2 J	<
Methylene chloride	<	<	<	<	1 BJ	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	<	.	<	61	52	.	.
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	.	<	3 J	<	.	.
2-Butanone	<	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	1 J	1 J	<	<
Dichlorodifluoromethane	<	<	<	<	.	<	2 J	<	.	.
Ethanol	<	<	<	<	.	<	<	<	.	.
Natural Attenuation (µg/L)										
Ethane	.	.	.	.	.	.	.	.	<	<
Ethylene	.	.	.	.	.	.	.	.	<	<
Methane	.	.	.	.	.	.	.	.	1.5 J	2.5 BJ

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-954-1		GW-954-2		GW-954-3		GW-956-1		
Functional Area	Y12		Y12		Y12		Y12		
Date Sampled	05/23/07	10/30/07	05/23/07	10/30/07	05/23/07	10/30/07	05/22/07		10/29/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type								Dup	
Chloroethenes (µg/L)									
Tetrachloroethene	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	4 J	2 J	<	<	<
Vinyl chloride	<	<	<	<	1 J	<	<	<	<
Chloroethanes (µg/L)									
1,1,1,2-Tetrachloroethane	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	2 J	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)									
Benzene	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	<
2-Butanone	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	<	<	<
Ethanol	<	<	<	<	<	<	<	<	<
Natural Attenuation (µg/L)									
Ethane	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-956-2		GW-956-3		GW-956-4		GW-959	GW-960	
Functional Area	Y12		Y12		Y12		B9201-2	GRIDF2	
Date Sampled	05/22/07	10/29/07	05/22/07	10/29/07	05/22/07	10/29/07	11/20/07	02/28/07	09/10/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type									
Chloroethenes (µg/L)									
Tetrachloroethene	4 J	3 J	1 J	<	<	<	<	<	<
Trichloroethene	1 J	1 J	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	15	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)									
1,1,1,2-Tetrachloroethane	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.	.	.
Chloromethanes (µg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)									
Benzene	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	<
2-Butanone	<	<	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	<	<	<
Ethanol	<	<	<	<	<	<	<	<	<
Natural Attenuation (µg/L)									
Ethane	.	.	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GHK2.51WSW	NPR07.0SW	NPR12.0SW		NPR23.0SW	SCR7.1SP	SCR7.8SP
Functional Area	EXP-SW	EXP-SW	EXP-SW		EXP-SW	EXP-SW	EXP-SW
Date Sampled	11/06/07	11/06/07	11/06/07		11/06/07	01/18/07	01/18/07
Program	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC
Sample Type				Dup			
Chloroethenes (µg/L)							
Tetrachloroethene	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<
Chloroethanes (µg/L)							
1,1,1,2-Tetrachloroethane	<	<	<	<	<	.	.
1,1,1-Trichloroethane	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<
1,4-Dioxane	.	.	.	.	.	.	.
Chloromethanes (µg/L)							
Carbon tetrachloride	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	2 J	<
Methylene chloride	<	<	<	<	<	1 JB	2 JB
Chloromethane	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)							
Benzene	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<
Total Xylene	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<
Miscellaneous (µg/L)							
1,1,2-Trichloro-1,2,2-trifluoroethane	<	<	<	<	<	.	.
1,2-Dichloropropane	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	.	.
2-Butanone	<	<	<	<	<	<	<
2-Hexanone	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	.	.
Ethanol	<	<	<	<	<	.	.
Natural Attenuation (µg/L)							
Ethane	.	.	.	.	.	.	.
Ethylene	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.

APPENDIX E.3

RADIOLOGICAL ANALYTES

APPENDIX E.3: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Functional Area	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	TPU	MDA	Activity	TPU	MDA
55-1A	GRIDB2	06/11/07	GWPP	<	.	2.9	<	.	5.5
55-2A	GRIDB3	02/20/07	GWPP	<	.	8.4	<	.	17
55-2A	GRIDB3	08/23/07	GWPP	<	.	17	<	.	25
55-2B	GRIDB3	02/20/07	GWPP	<	.	8.5	30	8.9	13
55-2B	GRIDB3	08/23/07	GWPP	23 Q	18	21	59 Q	17	23
55-2C	GRIDB3	02/20/07	GWPP	<	.	9.1	<	.	17
55-3A	B9201-5	02/21/07	GWPP	<	.	2.7	6.6	3.1	5
55-3A	B9201-5	08/22/07	GWPP	<	.	4.6	8.4	4.1	6.9
55-3B	B9201-5	02/21/07	GWPP	<	.	2.9	<	.	6.7
55-3B	B9201-5	08/22/07	GWPP	<	.	4.4	<	.	7.3
55-3C	B9201-5	02/21/07	GWPP	<	.	3.7	7	3.4	6.1
55-3C	B9201-5	08/27/07	GWPP	<	.	5.8	12	4.5	7.6
56-1A	Y12	06/07/07	GWPP	<	.	1.8	<	.	7
56-1A	Y12	10/15/07	GWPP	<	.	4.4	11	4.4	7.3
56-2A	GRIDC3	03/01/07	GWPP	<	.	3.3	<	.	6.6
56-2A Dup	GRIDC3	03/01/07	GWPP	<	.	2.7	<	.	6.7
56-2B	GRIDC3	03/05/07	GWPP	3 R	3.4	2.5	<	.	7.3
56-2C	GRIDC3	03/05/07	GWPP	4.1	3.7	2.2	<	.	5.4
56-3A	Y12	02/22/07	GWPP	<	.	2.9	<	.	6.6
56-3A Dup	Y12	02/22/07	GWPP	<	.	2.5	<	.	6.1
56-3A	Y12	08/30/07	GWPP	<	.	5.5	<	.	7.5
56-3B	Y12	02/22/07	GWPP	<	.	3.3	<	.	6.6
56-3B	Y12	09/04/07	GWPP	<	.	6	<	.	10
56-3C	Y12	02/22/07	GWPP	<	.	2.5	<	.	5.6
56-3C	Y12	09/05/07	GWPP	<	.	6.1	<	.	8.1
56-4A	Y12	02/26/07	GWPP	<	.	2.1	<	.	7.3
56-4A	Y12	09/06/07	GWPP	<	.	4.1	6.4	3.5	5.7
56-6A	Y12	02/26/07	GWPP	<	.	3.1	6	3.1	5.2
56-6A	Y12	09/06/07	GWPP	<	.	3.7	9	4	6.7
56-6A Dup	Y12	09/06/07	GWPP	<	.	9	7	4	7
60-1A	Y12	05/30/07	GWPP	<	.	3.3	<	.	7
60-1A	Y12	11/19/07	GWPP	<	.	3.4	9	4	7
GW-105	S3	06/14/07	GWPP	<	.	36	<	.	66
GW-106	S3	06/18/07	GWPP	<	.	26	<	.	56
GW-108	S3	01/04/07	BJC	331	80.4	70	18,400	2,950	105
GW-108	S3	07/10/07	BJC	68.9	38.2	55.5	14,900	2,390	102
GW-109	S3	06/20/07	GWPP	<	.	340	2,800	490.00	660
GW-151	NHP	03/01/07	BJC	<	.	1.92	<	.	3.49
GW-151	NHP	08/01/07	BJC	<	.	1.84	5	2.33	4.32
GW-153	NHP	03/08/07	GWPP	<	.	2.4	<	.	6.6
GW-154	NHP	03/05/07	BJC	335	55.3	2.38	48.5	9.29	7.12
GW-154	NHP	08/15/07	BJC	275	46.5	2.82	89.3	15.6	7.22
GW-169	EXP-UV	03/01/07	BJC	<	.	2.46	<	.	3.84
GW-169	EXP-UV	08/02/07	BJC	1.75	0.981	1.37	6.58	2.24	3.69
GW-170	EXP-UV	03/01/07	BJC	<	.	2.4	16.7	3.76	3.61
GW-170 Dup	EXP-UV	03/01/07	BJC	<	.	2.33	15.8	3.64	3.68
GW-170	EXP-UV	08/02/07	BJC	2.28	1.28	1.82	11	3.1	4.57
GW-170 Dup	EXP-UV	08/02/07	BJC	3.09	1.41	1.95	13.7	3.47	4.61

APPENDIX E.3: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Functional Area	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	TPU	MDA	Activity	TPU	MDA
GW-192	B4	06/11/07	GWPP	<	.	3.1	<	.	6.6
GW-204	T0134	11/13/07	GWPP	78	7.6	3.9	18	5.4	7.7
GW-219	UOV	11/28/07	GWPP	260	16	7.1	65	9.1	10
GW-220	NHP	06/04/07	GWPP	<	.	2.1	<	.	5.4
GW-220	NHP	11/20/07	GWPP	<	.	4.1	<	.	8
GW-223	NHP	03/06/07	BJC	13.9	3.65	1.89	9.11	2.73	3.83
GW-223	NHP	08/06/07	BJC	11.5	3.65	2.84	7.49	2.64	4.14
GW-240	NHP	03/08/07	GWPP	<	.	2.4	9	3.8	6.7
GW-251	S2	06/25/07	GWPP	<	.	3.9	<	.	6.6
GW-253	S2	03/08/07	BJC	30.3	5.9	3.05	23.5	5.2	5.37
GW-265	SY	06/05/07	GWPP	<	.	2.6	<	.	6.6
GW-265 Dup	SY	06/05/07	GWPP	3.8	3.1	2.9	<	.	6.7
GW-265	SY	10/17/07	GWPP	<	.	5.7	<	.	10
GW-269	SY	06/05/07	GWPP	<	.	1.9	<	.	5.6
GW-269	SY	10/17/07	GWPP	<	.	5.1	15	4.5	6.7
GW-270	SY	06/06/07	GWPP	5.6 R	5.7	4.2	19	6.7	10
GW-270 Dup	SY	06/06/07	GWPP	7.6	5.8	4.2	<	.	13
GW-272	SY	03/14/07	GWPP	34	34	25	<	.	61
GW-273	SY	06/06/07	GWPP	2.3 R	2.6	1.6	<	.	5.4
GW-274	SY	03/13/07	GWPP	<	.	97	4,400	250	170
GW-275	SY	03/13/07	GWPP	<	.	280	<	.	550
GW-332	WCPA	03/06/07	GWPP	<	.	2.6	<	.	6.7
GW-336	WCPA	03/06/07	GWPP	4.3	3.2	1.9	<	.	5.4
GW-337	WCPA	03/06/07	GWPP	<	.	2.9	<	.	5.2
GW-380	NHP	03/05/07	BJC	8.77	2.4	1.56	12	2.84	3.14
GW-380	NHP	08/15/07	BJC	<	.	1.9	5.12	2.12	3.65
GW-381	NHP	12/04/07	GWPP	<	.	2.6	<	.	5
GW-382	NHP	03/06/07	BJC	2.44	1.48	2.05	5.5	2.09	3.44
GW-382	NHP	08/02/07	BJC	2.45	1.35	1.97	<	.	4.09
GW-383	NHP	06/20/07	GWPP	2.8 R	3.6	2.2	<	.	6.9
GW-383	NHP	11/19/07	GWPP	2.8 R	3.4	2.1	<	.	7.3
GW-383 Dup	NHP	11/19/07	GWPP	<	.	4.7	<	.	10
GW-505	RG	06/18/07	GWPP	15	3.9	2.4	<	.	6.6
GW-605	EXP-I	01/03/07	BJC	47.8	9.88	3.48	13.1	3.48	4.54
GW-605 Dup	EXP-I	01/03/07	BJC	71.1	13.1	2.53	12	3.59	5.12
GW-605	EXP-I	07/09/07	BJC	49.4	10.2	2.61	21	4.66	4.41
GW-605 Dup	EXP-I	07/09/07	BJC	48.7	9.8	2.44	21.1	4.66	4.49
GW-606	EXP-I	01/03/07	BJC	10.3	3.26	2.72	5.47	2.47	4.44
GW-606	EXP-I	07/09/07	BJC	9.62	2.62	1.83	5.8	2.08	3.36
GW-618	EXP-E	03/08/07	BJC	<	.	2.46	5.47	2.17	3.71
GW-620	FTF	06/19/07	GWPP	<	.	2	21	4.6	6.7
GW-656	T0134	11/13/07	GWPP	<	.	6.5	9.7	4	6.5
GW-686	CPT	06/13/07	GWPP	<	.	2.9	<	.	6.1
GW-686	CPT	10/18/07	GWPP	<	.	6.5	<	.	6.3
GW-686 Dup	CPT	10/18/07	GWPP	9.9	6.5	7.3	12	4.8	7.3
GW-690	CPT	10/22/07	GWPP	<	.	12	<	.	15
GW-691	CPT	10/22/07	GWPP	<	.	15	<	.	32
GW-692	CPT	10/16/07	GWPP	<	.	4.5	12	4.5	7.3

APPENDIX E.3: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Functional Area	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	TPU	MDA	Activity	TPU	MDA
GW-698	B8110	06/13/07	GWPP	<	.	4.4	<	.	14
GW-698	B8110	10/16/07	GWPP	40 Q	14	11	21 Q	10	17
GW-700	B8110	10/25/07	GWPP	<	.	6.2	<	.	7.6
GW-700 Dup	B8110	10/25/07	GWPP	<	.	3.6	<	.	8.6
GW-722-06	EXP-J	09/13/07	GWPP	<	.	7.6	8.2	4.3	7.7
GW-722-10	EXP-J	09/17/07	GWPP	<	.	5.8	8.7	3.7	5.9
GW-722-14	EXP-J	09/18/07	GWPP	<	.	6.1	14	4.7	7.6
GW-722-17	EXP-J	09/18/07	GWPP	8.1	4.9	3.5	<	.	8.6
GW-722-20	EXP-J	09/17/07	GWPP	<	.	4.6	9.9	4.4	7.3
GW-722-22	EXP-J	09/17/07	GWPP	<	.	5.3	<	.	7.4
GW-722-26	EXP-J	09/13/07	GWPP	14 Q	4.9	4.9	<	.	10
GW-722-30	EXP-J	09/13/07	GWPP	6.3	3.9	2.3	<	.	7.3
GW-722-32	EXP-J	09/13/07	GWPP	<	.	6.1	9.5	4.1	6.8
GW-722-32 Dup	EXP-J	09/13/07	GWPP	5	3.7	3.8	7.3	4.1	7.2
GW-722-33	EXP-J	09/17/07	GWPP	<	.	4.9	6.3	3.7	6.3
GW-733	EXP-J	01/04/07	BJC	<	.	1.96	<	.	3.76
GW-733	EXP-J	07/09/07	BJC	<	.	2.2	4.32	2.01	3.64
GW-735	EXP-J	03/08/07	GWPP	6.4	4.2	2.9	<	.	6.1
GW-735 Dup	EXP-J	03/08/07	GWPP	3.6 R	4	3	<	.	5.5
GW-744	GRIDK1	03/15/07	GWPP	3	3	1.8	<	.	7
GW-747	GRIDK2	03/15/07	GWPP	<	.	2.5	<	.	5.9
GW-750	EXP-J	03/07/07	GWPP	<	.	2.5	<	.	7.3
GW-762	GRIDJ3	03/01/07	BJC	<	.	2.08	<	.	3.53
GW-762 Dup	GRIDJ3	03/01/07	BJC	<	.	1.83	3.86	1.94	3.58
GW-762	GRIDJ3	08/06/07	BJC	<	.	2.01	<	.	3.57
GW-762 Dup	GRIDJ3	08/06/07	BJC	<	.	2.25	4.13	2.08	3.88
GW-763	GRIDJ3	12/03/07	GWPP	<	.	5.4	<	.	7.4
GW-765	GRIDE1	12/03/07	GWPP	<	.	3.1	<	.	5.6
GW-769	GRIDG3	05/29/07	GWPP	14 Q	5	3	16	3.9	5
GW-769	GRIDG3	11/13/07	GWPP	5.8	3.7	3.7	8.4	4.1	6.9
GW-770	GRIDG3	05/29/07	GWPP	<	.	3	<	.	6.6
GW-770	GRIDG3	11/12/07	GWPP	<	.	3.8	<	.	7.1
GW-775	GRIDH3	11/29/07	GWPP	<	.	5.1	<	.	10
GW-775 Dup	GRIDH3	11/29/07	GWPP	<	.	4.4	<	.	8
GW-776	GRIDH3	11/29/07	GWPP	<	.	5.8	8.3	4	6.8
GW-779	GRIDF2	02/27/07	GWPP	7.5	3.7	2	<	.	5.4
GW-779	GRIDF2	09/10/07	GWPP	<	.	3.9	<	.	7.2
GW-781	GRIDE3	11/27/07	GWPP	<	.	4.5	10	4.3	7.3
GW-782	GRIDE3	11/27/07	GWPP	25	5.3	2.9	16	5.4	8.5
GW-783	GRIDE3	11/28/07	GWPP	15 Q	4.7	2.3	8.1	4.4	7.3
GW-791	GRIDD2	11/12/07	GWPP	<	.	7.9	28 Q	6.2	10
GW-792	GRIDD2	11/12/07	GWPP	<	.	4.2	<	.	9.6
GW-816	EXP-SR	03/07/07	GWPP	2.8 R	3.1	2.4	<	.	6.7
GW-820	B9201-2	05/30/07	GWPP	<	.	2.1	<	.	5.4
GW-820	B9201-2	11/20/07	GWPP	<	.	2.8	<	.	8.5
GW-832	NHP	03/05/07	BJC	3.01	1.68	2.09	<	.	4.06
GW-832	NHP	08/15/07	BJC	3.89	1.76	1.9	6	2.25	3.65

APPENDIX E.3: CY 2007 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Functional Area	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	TPU	MDA	Activity	TPU	MDA
GW-954-1	Y12	05/23/07	GWPP	<	.	2.4	<	.	5.6
GW-954-1	Y12	10/30/07	GWPP	6.9	4.8	3.5	<	.	8.6
GW-954-2	Y12	05/23/07	GWPP	<	.	3.1	<	.	6.6
GW-954-2	Y12	10/30/07	GWPP	6.7	5.1	6.4	<	.	7.4
GW-954-3	Y12	05/23/07	GWPP	4.9	4.4	3.2	<	.	6.7
GW-954-3	Y12	10/30/07	GWPP	<	.	5.2	10	4.2	6.9
GW-956-1	Y12	05/22/07	GWPP	<	.	2.9	<	.	7.2
GW-956-1 Dup	Y12	05/22/07	GWPP	3.5 R	3.8	2.3	<	.	5.4
GW-956-1	Y12	10/29/07	GWPP	<	.	5.6	<	.	7.4
GW-956-2	Y12	05/22/07	GWPP	<	.	2.8	5.5	3.1	5.2
GW-956-2	Y12	10/29/07	GWPP	<	.	5.1	8.9	3.7	5.8
GW-956-3	Y12	05/22/07	GWPP	<	.	2	<	.	5.4
GW-956-3	Y12	10/29/07	GWPP	13	5	3.7	11	4.6	7.9
GW-956-4	Y12	05/22/07	GWPP	6.2	4.3	3	9.7	3.4	5
GW-956-4	Y12	10/29/07	GWPP	<	.	5.6	8.3	4.2	7.6
GW-959	B9201-2	11/20/07	GWPP	<	.	6.2	13	4.3	6.8
GW-960	GRIDF2	02/28/07	GWPP	<	.	3.5	<	.	5.2
GW-960	GRIDF2	09/10/07	GWPP	<	.	5	8.6	3.9	6.3
GHK2.51WSW	EXP-SW	11/06/07	GWPP	4.9	3.3	3	10	4.1	6.6
NPR07.0SW	EXP-SW	11/06/07	GWPP	<	.	4.4	9.8	4.4	7.6
NPR12.0SW	EXP-SW	11/06/07	GWPP	<	.	3.8	7.4	4.2	7.4
NPR12.0SW Dup	EXP-SW	11/06/07	GWPP	<	.	4.3	<	.	10
NPR23.0SW	EXP-SW	11/06/07	GWPP	<	.	5.2	12	4.2	6.7
STATION 8	EXP-SW	01/16/07	BJC	8.41	3.19	3.22	6.41	2.5	4.1
STATION 8	EXP-SW	07/11/07	BJC	5.35	2.14	1.99	9.12	2.6	3.54

APPENDIX E.3: CY 2006 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotopic Analyses

Sampling Point	GW-108			GW-108			GW-109			GW-151		
Functional Area	S3			S3			S3			NHP		
Date Sampled	01/04/07			07/10/07			06/20/07			03/01/07		
Program	BJC			BJC			GWPP			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	331	80.4	70	68.9	38.2	55.5	<	.	340	<	.	1.92
Gross Beta	18,400	2,950	105	14,900	2,390	102	2,800	490	660	<	.	3.49
Technetium-99	30,000	4,780	6.43	29,000	4,620	10.7	7,100	47	14	.	.	.
Uranium-234	.	.	.	.	.	.	3.2	1.4	2.1	1.08	0.586	0.543
Uranium-235	.	.	.	.	.	.	<	.	0.92	<	.	0.401
Uranium-236	.	.	.	.	.	.	<	.	0.62	.	.	.
Uranium-238	.	.	.	.	.	.	5.9	1.6	1.6	<	.	0.519

Sampling Point	GW-151			GW-154						GW-193		
Functional Area	NHP			NHP						T2331		
Date Sampled	08/01/07			03/05/07			08/15/07			01/04/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	<	.	1.84	335	55.3	2.38	275	46.5	2.82	.	.	.
Gross Beta	5	2.33	4.32	48.5	9.29	7.12	89.3	15.6	7.22	.	.	.
Technetium-99	.	.	.	.	.	.	.	.	.	<	.	5.97
Uranium-234	0.598	0.322	0.265	311	50.6	0.285	292	46.4	0.432	.	.	.
Uranium-235	<	.	0.265	18.1	3.59	0.285	19.9	3.71	0.359	.	.	.
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	0.312	0.23	0.235	96.3	16.2	0.335	153	24.7	0.246	.	.	.

Sampling Point	GW-193			GW-223						GW-272		
Functional Area	T2331			NHP						SY		
Date Sampled	07/09/07			03/06/07			08/06/07			03/14/07		
Program	BJC			BJC			BJC			GWPP		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	.	.	.	13.9	3.65	1.89	11.5	3.65	2.84	34	34	25
Gross Beta	.	.	.	9.11	2.73	3.83	7.49	2.64	4.14	<	.	61
Technetium-99	<	.	5.85	.	.	.	.	.	.	<	.	14
Uranium-234	.	.	.	5.56	1.49	0.537	5.38	1.25	0.288	7.3	1.2	0.26
Uranium-235	.	.	.	0.833	0.505	0.537	0.837	0.393	0.213	0.36	0.25	0.28
Uranium-236	.	.	.	.	.	.	.	.	.	<	.	0.24
Uranium-238	.	.	.	11.8	2.57	0.612	11.1	2.18	0.213	7.9	1.3	0.37

APPENDIX E.3: CY 2006 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotopic Analyses

Sampling Point	GW-274			GW-275			GW-605					
Functional Area	SY			SY			EXP-I					
Date Sampled	03/13/07			03/13/07			01/03/07					
Program	GWPP			GWPP			BJC			BJC		
Sample Type										Dup		
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	<	.	97	<	.	280	47.8	9.88	3.48	71.1	13.1	2.53
Gross Beta	4,400	250	170	<	.	550	13.1	3.48	4.54	11.6	3.59	5.12
Technetium-99	11,000	63	17	<	.	15	<	.	6.19	<	.	6
Uranium-234	3.2	0.67	0.23	0.44	0.27	0.27	.	.	.	.	.	.
Uranium-235	<	.	0.26	<	.	0.23	.	.	.	.	.	.
Uranium-236	<	.	0.22	<	.	0.23	.	.	.	.	.	.
Uranium-238	1.7	0.48	0.33	<	.	0.34	.	.	.	.	.	.

Sampling Point	GW-605						GW-606					
Functional Area	EXP-I						EXP-I					
Date Sampled	07/09/07						01/03/07			07/09/07		
Program	BJC			BJC			BJC			BJC		
Sample Type				Dup								
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	49.4	10.2	2.61	48.7	9.8	2.44	10.3	3.26	2.72	9.62	2.62	1.83
Gross Beta	21.3	4.66	4.41	21.1	4.66	4.49	5.47	2.47	4.44	5.8	2.08	3.36
Technetium-99	<	.	5.83	<	.	6.01	<	.	6.39	<	.	5.82
Uranium-234	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-235	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	.	.	.	.	.	.	.	.	.	.	.	.

Sampling Point	GW-832						STATION 8					
Functional Area	NHP						EXP-SW					
Date Sampled	03/05/07			08/15/07			01/16/07			07/11/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	3.01	1.68	2.09	3.89	1.76	1.9	8.41	3.19	3.22	5.35	2.14	1.99
Gross Beta	<	.	4.06	6	2.25	3.65	6.41	2.5	4.1	9.12	2.6	3.54
Technetium-99	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-234	1.52	0.658	0.522	1.15	0.532	0.377	2.78	0.967	0.179	3.46	1.26	0.492
Uranium-235	<	.	0.375	<	.	0.259	<	.	0.405	<	.	0.492
Uranium-236	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-238	1.87	0.724	0.402	1.34	0.57	0.259	7.34	1.83	0.31	2.67	1.08	0.419

APPENDIX F

CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME

EXPLANATION

Sampling Point:

GW	-	Groundwater monitoring well (e.g., GW-141; one exception is 1090)
MCK	-	McCoy Branch Kilometer
S17	-	Surface water station in SCR5
SCR	-	South Chestnut Ridge (tributary prefix for spring and surface water sampling locations)

Location:

CDLVI	-	Construction/Demolition Landfill VI
CDLVII	-	Construction/Demolition Landfill VII
CRBAWP	-	Former Chestnut Ridge Borrow Area Waste Pile
CRSDB	-	Chestnut Ridge Sediment Disposal Basin
CRSP	-	Chestnut Ridge Security Pits
ECRWP	-	East Chestnut Ridge Waste Pile
EXP-SW	-	Exit Pathway (spring or surface water sampling location)
FCAP	-	Filled Coal Ash Pond
KHQ	-	Kerr Hollow Quarry
LII	-	Industrial Landfill II
LIV	-	Industrial Landfill IV
LV	-	Industrial Landfill V
UNCS	-	United Nuclear Corporation Site

Monitoring Program:

BJC	-	monitoring program managed by Bechtel Jacobs Company LLC
GWPP	-	managed by the Y-12 Groundwater Protection Program

Sample Type:

Dup	-	Field Duplicate Sample

Units:

ft	-	feet (elevations are above mean sea level and depths are below grade)
µg/L	-	micrograms per liter
mg/L	-	milligrams per liter
mV	-	millivolts
µmho/cm	-	micromhos per centimeter
NTU	-	Nephelometric Turbidity Units
pCi/L	-	picoCuries per liter
ppm	-	parts per million

EXPLANATION (continued)

Only analytes detected above the program reporting limits in at least one sample are presented in this appendix. Additionally, results that are below the reporting limits are replaced with values (e.g., "<") to emphasize the detected results. The following sections describe the reporting limits and data qualifiers for each subsection of the appendix. A comprehensive list of the Y-12 GWPP analytes, analytical methods, and reporting limits is provided in Appendix B, Table B.5.

F.1 Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals:

Results for all of the field measurements, miscellaneous analytes, and major ions are included in this appendix. The reporting limits for the major ions are shown in the following summary.

Analyte	Reporting Limit (mg/L)		Analyte	Reporting Limit (mg/L)	
	GWPP	BJC		GWPP	BJC
Cations			**Anions**		
Calcium	0.2	0.25	Bicarbonate	1.0	NS
Magnesium	0.2	0.05	Carbonate	1.0	NS
Potassium	2.0	0.25	Chloride	0.2	0.1
Sodium	0.2	0.25	Fluoride	0.1	0.05
			Nitrate (as Nitrogen)	0.028	0.1
			Sulfate	0.25	0.1
Note: NS = not specified					

The major ion results are qualitative because the ion charge balance error (percent) exceeds 20% for the July sample from well GW-205 and the January sample from spring SCR1.25SP. In both cases, the alkalinity results (bicarbonate and/or carbonate) are the suspected source of the elevated error.

The Y-12 GWPP SAP (BWXT 2006a) specifies analytical methods and reporting limits for trace metals that are appropriate for DOE Order monitoring. Some of the laboratories used for the monitoring programs managed by BJC report metals results (often as estimated values) that are lower than the GWPP reporting limits for the metals. For this report, the analytical methods for metals used by BJC monitoring programs (EPA-7470, SW846-6010B, SW846-6020, and ASTM-D5174-M) are considered to be functionally equivalent to the methods used by the GWPP (Table B.5) To retain the highest quality data for DOE Order monitoring purposes and to standardize reporting limits for trace metal results obtained from all sources, the GWPP reporting limits were given precedence over the BJC reporting limits (BJC 2006) shown below. Results for the trace metals shown in bold typeface below are presented in Appendix F.1 because the metal was detected at a level above the associated reporting limit in at least one groundwater or surface water sample.

EXPLANATION (continued)

Analyte	Reporting Limit (mg/L)		Analyte	Reporting Limit (mg/L)	
	GWPP	BJC		GWPP	BJC
Aluminum	0.2	0.05*	**Lithium**	0.01	0.01
Antimony	0.0025	0.003	**Manganese**	0.005	0.005
Arsenic	0.005	0.005	Mercury	0.0002	0.0002
Barium	0.004	0.005	Molybdenum	0.05	0.01*
Beryllium	0.0005	0.001	**Nickel**	0.005	0.01
Boron	0.1	0.01*	Selenium	0.01	0.0025*
Cadmium	0.0025	0.00013*	Silver	0.02	0.0015*
Chromium	0.01	0.005*	**Strontium**	0.005	0.005
Cobalt	0.02	0.005*	**Thallium**	0.0005	0.001
Copper	0.02	0.005*	Thorium	0.2	NS
Iron	0.05	0.01*	**Uranium**	0.0005	0.004
Lead	0.0005	0.002	Vanadium	0.02	0.01*
			Zinc	0.05	0.01*

Note: * - the GWPP reporting limit is used instead of the BJC reporting limit (several BJC reporting limits were lowered in March 2007); "NS" - not specified.

The following symbols and data qualifiers are used in Appendix F.1:

. - Not analyzed or not applicable
< - Analyzed but not detected at the project reporting level
J - Positively identified; estimated concentration (BJC results)
Q - Inconsistent with historical measurements for a sampling location (e.g., elevated chromium and nickel at well GW-141 in July 2007)

EXPLANATION (continued)

F.2 Volatile Organic Compounds:

The reporting limits for volatile organic compounds shown in Table B.5 and those used for monitoring programs managed by BJC are contract-required quantitation limits. Results below the quantitation limit and above the instrument detection limit are reported as estimated quantities. Therefore, non-detected results are assumed to equal zero for all compounds.

Fourteen of the 55 compounds requested were detected in the CY 2007 groundwater samples collected in the Chestnut Ridge Regime. Results for these compounds are grouped by similar chemical composition (e.g., chloroethenes) in Appendix F.2.

Compound	No. Detected	Maximum (µg/L)	Compound	No. Detected	Maximum (µg/L)
1,1-Dichloroethane	13	51	Chloroform	2	3.1
1,1,1-Trichloroethane	13	19	Methylene chloride	2	2 BJ
1,1-Dichloroethene	12	26	Trichloroethene	2	0.44 J
Tetrachloroethene	8	18	Dibromochloromethane	2	0.19 J
Trichlorofluoromethane	6	12	Carbon tetrachloride	1	2.6 J
1,1,2-Trichloro-1,2,2-trifluoroethane	3	6	Acetone	1	2 J
cis-1,2-Dichloroethene	2	4.3 J	Bromoform	1	0.27 J

The following symbols and data qualifiers are used in Appendix F.2:

- . - Not analyzed
- < - Analyzed but not detected at the project reporting level (also false-positive results for data provided by BJC)
- B - Also detected in the associated method (laboratory) blank
- J - Positively identified; estimated concentration

EXPLANATION (continued)

F.3 Radiological Analytes

Reporting limits for radiological analytes are sample-specific and analyte-specific minimum detectable activities that are reported with each result. The following summary shows the radiological analytes reported for at least one groundwater sample collected during CY 2007 in the Chestnut Ridge Regime.

Analyte	No. of Results	No. Detected	Analyte	No. of Results	No. Detected
Gross Alpha	101	14	Strontium-90	8	0
Gross Beta	94	21	Technetium-99	2	0
Cesium-137	2	0	Uranium-234	8	6
Cobalt-60	2	0	Uranium-235	8	0
Potassium-40	2	1	Uranium-238	8	0
Note: * = Reported by BJC laboratories in Appendix F.3 as equivalent GWPP analytes: U-233/234 = U-234; U-235/236 = U-235.					

Results for gross alpha and gross beta are presented in the first two pages of Appendix F.3, followed by results for the isotopes. The following notes and qualifiers apply to this appendix:

Result - Activity in picoCuries per liter (pCi/L)
TPU - Total propagated uncertainty (two standard deviations); calculation includes the counting error (instrument uncertainty) plus other sources of uncertainty (e.g., volumetric, chemical yield)
MDA - Minimum detectable activity
. - Not analyzed
< - Analyzed but less than the MDA (not detected)
R - Result does not meet data quality objectives: exceeds the MDA but is less than the TPU.
Q - Inconsistent with historical measurements for a sampling location (e.g., first detection [24 pCi/L] of gross beta at station SCR3.5SW)

APPENDIX F.1

FIELD MEASUREMENTS, MISCELLANEOUS ANALYTES, MAJOR IONS, AND TRACE METALS

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	1090		GW-141		GW-143	GW-144	GW-145	GW-156		GW-159
Functional Area	UNCS		LIV		KHQ	KHQ	KHQ	CRSDB		CRSDB
Date Sampled	01/31/07	07/25/07	01/11/07	07/16/07	01/08/07	01/04/07	01/08/07	01/08/07		01/08/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type									Dup	
Field Measurements										
Time Sampled	14:30	15:10	10:00	9:30	10:50	15:30	10:35	14:15	.	14:45
Measuring Point Elev. (ft)	1,104.48	1,104.48	1,186.23	1,186.23	913.98	913.54	840.24	1,049.28	.	1,051.38
Depth to Water (ft)	52.92	60.54	95.40	99.74	81.65	82.10	7.05	143.56	.	118.00
Groundwater Elevation (ft)	1,051.56	1,043.94	1,090.83	1,086.49	832.33	831.44	833.19	905.72	.	933.38
Conductivity (μmho/cm)	600	1,092	804	827	278	233	681	362	.	438
Dissolved Oxygen (ppm)	1.58	2.7	8.29	6.44	4.34	7.36	4.48	10.03	.	6.62
Oxidation/Reduction (mV)	75	63	198	115	-124	132	198	58	.	230
Temperature (degrees C)	14.5	17.2	12.8	19.8	9.8	14.6	8.5	11.2	.	12.1
Turbidity (NTU)	1	1	1	4	1	1	1	1	.	2
pH	7.52	7.48	7.22	7.4	7.73	7.5	7.7	7.32	.	7.84
Miscellaneous Analytes										
Dissolved Solids (mg/L)	309	296	190	200	286	269	300	384	401	226
Suspended Solids (mg/L)	<	<	1.2 J	<	<	<	<	<	<	<
Turbidity (NTU)	.	.	0.92	1.2	.	.	.	.	.	.
Major Ions (mg/L)										
Calcium	53.5	50.3	44	43	29.8	54.8	43	66.5	65.6	40.9
Magnesium	31.7	30.2	26	25	25.3	18.5	35.9	41.9	41.3	25.6
Potassium	0.912	0.822	0.66 J	<	17.3	1.62	11.7	20.5	20.3	1.06
Sodium	6.58	6.24	0.8 J	<	19.3	1.1	4.16	5.78	5.69	0.529
Bicarbonate	257	254	210	200	.	.	.	.	.	.
Carbonate	<	<	<	<	.	.	.	.	.	.
Chloride	14.6	13.8	1.4 J	<	.	.	.	.	.	.
Fluoride	<	<	<	<	.	.	.	.	.	.
Nitrate as N	0.58	0.58	0.33 J	<	.	.	.	.	.	.
Sulfate	3.1	3	2 J	<	.	.	.	.	.	.
Charge Balance Error (%)	-1	-3.4	-0.8	-10.4	.	.	.	.	.	.
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	<	<	<	<
Antimonony	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.0267	0.0274	0.016	0.017	0.0463	0.0506	0.088	0.0347	0.0344	0.0133
Boron	<	<	<	<	0.812	<	0.235	<	<	<
Chromium	<	<	<	0.1 Q	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	<	<	<	<	0.68	<	<	0.0876	0.075	0.0677
Lead	<	<	<	<	<	<	<	<	<	<
Lithium	<	<	.	.	0.315	0.0269	0.114	<	<	<
Manganese	<	<	<	<	0.0094	<	<	<	<	<
Nickel	<	<	<	0.032 Q	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	0.0249	0.0254	0.015	0.015	2.88 J	0.105	6.64 J	0.0265 J	0.0263 J	0.019 J
Uranium	<	<	<	.	<	<	0.012	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-161		GW-174	GW-176	GW-177		GW-179	GW-180	
Functional Area	ECRWP		CRSP	CRSP	CRSP		CRSP	CRSP	
Date Sampled	01/25/07	07/10/07	05/15/07	05/17/07	01/09/07	07/11/07	05/21/07	05/16/07	
Program	BJC	BJC	GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP
Sample Type									Dup
Field Measurements									
Time Sampled	13:40	14:40	9:25	8:50	13:30	9:45	9:45	10:05	10:05
Measuring Point Elev. (ft)	1,093.54	1,093.54	1,116.66	1,125.30	1,158.20	1,158.20	1,128.00	1,104.14	1,104.14
Depth to Water (ft)	160.12	161.98	116.85	116.18	119.42	119.19	116.05	114.40	114.40
Groundwater Elevation (ft)	933.42	931.56	999.81	1,009.12	1,038.78	1,039.01	1,011.95	989.74	989.74
Conductivity (μmho/cm)	800	936	460	591	192	495	521	453	453
Dissolved Oxygen (ppm)	8.01	4.49	2.18	5.48	7.41	3.78	4.19	7.38	7.38
Oxidation/Reduction (mV)	104	87	122	160	105	134	167	182	182
Temperature (degrees C)	14.2	17.6	20.9	15.5	13.9	21.6	19.9	14.8	14.8
Turbidity (NTU)	6	17	.	.	1	1	.	.	.
pH	7.6	7.96	7.89	7.11	7.3	7.54	7.13	7.25	7.26
Miscellaneous Analytes									
Dissolved Solids (mg/L)	.	.	234	279	266	256	277	209	219
Suspended Solids (mg/L)	.	.	<	<	<	<	<	<	<
Turbidity (NTU)	.	.	0.122	1.26	.	.	1.61	0.648	0.656
Major Ions (mg/L)									
Calcium	44.8	36.1	40	55.2	47.4	45.4	60.6	45.4	44.8
Magnesium	26.7	23.8	29.4	35.2	29.3	28.9	35.7	29.3	29.1
Potassium	0.902	2.09	<	<	2.67	2.55	4.38	<	<
Sodium	0.825	1.48	8.18	0.694	1.25	1.12	0.945	0.637	0.623
Bicarbonate	219	210	229	291	.	.	301	243	240
Carbonate	<	<	<	<	.	.	<	<	<
Chloride	2.6	2.6	9.22	1.81	.	.	1.31	1.58	1.56
Fluoride	<	<	<	<	.	.	<	<	<
Nitrate as N	0.22	<	0.605	0.54	.	.	0.585	0.273	0.343
Sulfate	1.5	0.58	3.26	1.52	.	.	1.73	0.73	0.76
Charge Balance Error (%)	-1	-5.5	-1.8	-2.2	.	.	-0.1	-2.4	-2.4
Trace Metals (mg/L)									
Aluminum	<	<	<	<	<	<	<	<	<
Antimony	<	<	<	<	<	<	<	<	<
Arsenic	<	<	0.0269 Q	<	<	<	<	<	<
Barium	0.0148	0.0143	0.0311	0.0207	0.0155	0.0157	0.0188	0.0197	0.02
Boron	<	<	<	0.126	<	<	<	<	<
Chromium	<	<	<	<	0.0127	0.0194	<	<	<
Copper	<	<	<	<	<	<	0.0222	<	<
Iron	2.59	4.14	0.0622	<	<	<	0.0669	<	<
Lead	<	<	<	<	<	<	0.00159	<	<
Lithium	<	<	<	<	<	<	<	<	<
Manganese	0.0079	0.262 Q	<	<	<	<	<	<	<
Nickel	<	<	<	<	0.0113	0.0134	<	<	<
Selenium	<	<	0.135 Q	<	<	<	<	<	<
Strontium	0.0138	0.015	0.051	0.0208	0.0175 J	0.0178	0.0301	0.0148	0.0149
Uranium	<	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	0.0607	<	<	<	<

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-203		GW-205		GW-217		GW-221		GW-231	
Functional Area	UNCS		UNCS		LIV		UNCS		KHQ	
Date Sampled	01/31/07	07/25/07	01/31/07	07/26/07	01/10/07	07/12/07	01/31/07	07/25/07	01/04/07	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type										Dup
Field Measurements										
Time Sampled	11:15	10:25	14:50	11:40	14:00	10:20	10:55	13:30	14:00	.
Measuring Point Elev. (ft)	1,105.45	1,105.45	1,104.14	1,104.14	1,177.03	1,177.03	1,106.16	1,106.16	849.67	.
Depth to Water (ft)	83.55	85.25	80.06	82.44	110.94	117.54	85.04	86.42	17.44	.
Groundwater Elevation (ft)	1,021.90	1,020.20	1,024.08	1,021.70	1,066.09	1,059.49	1,021.12	1,019.74	832.23	.
Conductivity (μmho/cm)	626	651	374	699	204	380	343	621	257	.
Dissolved Oxygen (ppm)	6.43	5.85	4.39	3.62	8.9	5.72	5.2	7.14	3.08	.
Oxidation/Reduction (mV)	160	106	144	181	119	99	71	82	129	.
Temperature (degrees C)	11.4	18.7	10.8	18.7	11.2	21.9	13.9	17.2	14.3	.
Turbidity (NTU)	2	1	1	1	1	0	3	2	3	.
pH	7.73	7.79	10.47	10.23	7.82	8.11	8.15	7.83	7.26	.
Miscellaneous Analytes										
Dissolved Solids (mg/L)	170	181	198	220	170	190	249	182	251	264
Suspended Solids (mg/L)	5.5	<	<	<	<	<	<	<	<	<
Turbidity (NTU)	.	.	.	.	0.11	<	.	.	.	.
Major Ions (mg/L)										
Calcium	33.9	31.7	1.29	1.27	35	34	29.9	30.4	49.7	52.3
Magnesium	19.3	18	11.4	10.9	21	21	17.7	18.3	25.9	27.3
Potassium	0.789	0.783	71.5	66.7	1.7 J	<	0.825	0.814	2.11	1.51
Sodium	0.59	0.553	10.9	9.75	5.4	4.4	0.452	0.445	0.792	0.786
Bicarbonate	158	164	87.1	115	180	180	147	146	.	.
Carbonate	<	<	79.2	131	<	<	<	<	.	.
Chloride	2.9	2.7	2.9	2.7	1.8 J	<	1.5	1.4	.	.
Fluoride	<	<	<	<	<	<	<	<	.	.
Nitrate as N	0.46	0.45	0.28	0.066	0.32 J	<	0.39	0.38	.	.
Sulfate	1.7	1.6	3	3	5.1	<	1.1	1.1	.	.
Charge Balance Error (%)	-0.4	-6	-6.8	-25.8 R	-2.3	-3.7	-1.5	0.2	.	.
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	<	<	<	<
Antimonony	<	<	<	<	<	<	0.0079	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.0119	0.0117	<	<	0.033	0.028	0.0074	0.0083	0.099	0.104
Boron	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	0.134	<	<	<	<	<	<	<	<	<
Lead	<	<	<	<	<	<	0.0042	<	<	<
Lithium	<	<	0.144	0.135	.	.	<	<	<	<
Manganese	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	0.0119	0.012	<	<	0.017	0.016	0.0098	0.0109	0.0497	0.0522
Uranium	<	<	<	<	<	.	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-292		GW-293				GW-294		GW-296	
Functional Area	ECRWP		ECRWP				ECRWP		ECRWP	
Date Sampled	01/23/07	07/10/07	01/24/07		07/10/07		01/22/07	07/11/07	01/22/07	07/10/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type				Dup		Dup				
Field Measurements										
Time Sampled	10:10	10:10	11:30	.	12:45	.	11:30	14:20	14:10	13:30
Measuring Point Elev. (ft)	1,073.00	1,073.00	1,063.90	.	1,063.90	.	1,083.60	1,083.60	1,090.99	1,090.99
Depth to Water (ft)	113.54	115.51	115.99	.	117.59	.	95.70	101.73	118.51	119.66
Groundwater Elevation (ft)	959.46	957.49	947.91	.	946.31	.	987.90	981.87	972.48	971.33
Conductivity (μmho/cm)	502	576	658	.	320	.	575	487	510	551
Dissolved Oxygen (ppm)	7.4	3.35	14.58	.	2.3	.	9.65	5.84	7.1	4.29
Oxidation/Reduction (mV)	211	180	243	.	248	.	292	155	207	134
Temperature (degrees C)	12.7	17.3	13.1	.	20.5	.	13.8	23.5	14.1	16.7
Turbidity (NTU)	3	5	6	.	100	.	1	1	0	2
pH	7.52	7.58	7.33	.	7.57	.	7.42	7.56	7.54	7.5
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	.	.	.	.	.	.	.	.
Suspended Solids (mg/L)	.	.	.	.	.	.	.	.	.	.
Turbidity (NTU)	.	.	.	.	.	.	.	.	.	.
Major Ions (mg/L)										
Calcium	54.4	50.3	63.6	63.6	48.1	49.1	50.5	48	45.3	42.2
Magnesium	32.3	30.7	32.2	32.3	29.8	30.4	31.3	30.7	28.1	26.4
Potassium	2.66	1.78	1.15	1.14	1.28	1.34	1.54	1.1	0.782	0.632
Sodium	6.79	6.6	8.14	8.11	7.13	7.25	6.43	4.4	1.28	1.39
Bicarbonate	260	260	272	264	254	244	240	237	225	265
Carbonate	<	<	<	<	<	<	<	<	<	<
Chloride	11.5	10.5	15.2	14.6	14.4	14.3	13.5	9.6	3.4	3.4
Fluoride	<	<	<	<	<	<	<	<	<	<
Nitrate as N	0.39	0.35	0.28	0.31	0.028	0.026	1.7	1.3	0.6	0.15
Sulfate	4.1	4.5	4.5	4.3	2.4	2.5	2.9	2.6	1.6	0.79
Charge Balance Error (%)	0.5	-2.6	1.2	2.7	-3.6	.	0.1	-0.6	-0.7	-11.7
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	<	<	<	<
Antimonony	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.116	0.103	0.204	0.203	0.165	0.157	0.0127	0.012	0.0108	0.0101
Boron	<	<	<	<	<	<	<	<	<	<
Chromium	0.01 Q	0.0257 Q	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	0.21 Q	0.588 Q	0.561	0.488	7.97	4.02	<	<	<	<
Lead	<	<	<	<	<	<	<	<	<	<
Lithium	<	<	<	<	<	<	<	<	<	<
Manganese	<	0.0114	0.0954	0.095	0.101	0.101	<	<	<	<
Nickel	0.0541 Q	0.0747	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	0.0257	0.0233	0.0284	0.028	0.0194	0.019	0.0258	0.0246	0.0162	0.0157
Uranium	<	<	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-298		GW-301				GW-305			
Functional Area	**ECRWP**		**CRBAWP**				**LIV**			
Date Sampled	**01/29/07**	**07/09/07**	**01/09/07**		**07/12/07**		**01/10/07**	**04/30/07**	**07/12/07**	**10/31/07**
Program	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**
Sample Type				**Dup**		**Dup**				
Field Measurements										
Time Sampled	11:10	14:00	13:00	.	13:00	.	11:30	10:20	14:20	10:20
Measuring Point Elev. (ft)	1,049.01	1,049.01	1,086.55	.	1,086.55	.	1,183.72	1,183.72	1,183.72	1,183.72
Depth to Water (ft)	109.25	110.92	135.43	.	136.03	.	122.61	122.30	128.14	131.57
Groundwater Elevation (ft)	939.76	938.09	951.12	.	950.52	.	1,061.11	1,061.42	1,055.58	1,052.15
Conductivity (μmho/cm)	677	672	786	.	284	.	214	741	353	703
Dissolved Oxygen (ppm)	6.61	2.38	5.4	.	9.19	.	9.89	7.19	3.56	5.84
Oxidation/Reduction (mV)	189	20	124	.	241	.	191	181	101	105
Temperature (degrees C)	5.1	24.2	12.8	.	21.3	.	9.1	16.2	23.8	12.8
Turbidity (NTU)	3	3	1	.	12	.	1	1	1	1
pH	7.81	8.07	7.96	.	7.93	.	7.32	8.03	8.03	8.32
Miscellaneous Analytes										
Dissolved Solids (mg/L)	.	.	.	.	.	.	170	160	180	170
Suspended Solids (mg/L)	.	.	.	.	.	.	<	<	<	<
Turbidity (NTU)	.	.	.	.	.	.	0.07 J	<	<	0.13
Major Ions (mg/L)										
Calcium	35.1	32.7	.	.	.	.	36	35	26	37
Magnesium	19.8	18.8	.	.	.	.	20	21	20	20
Potassium	0.731	0.799	.	.	.	.	1.1 J	<	<	<
Sodium	0.793	0.824	.	.	.	.	0.9 J	2.6	9.8	<
Bicarbonate	168	172	.	.	.	.	180	180	170	170
Carbonate	<	<	.	.	.	.	<	<	<	<
Chloride	1.1	0.98	.	.	.	.	6	3.8	3.7	5.2
Fluoride	<	<	.	.	.	.	<	<	<	<
Nitrate as N	0.4	0.075	.	.	.	.	0.37 J	<	<	<
Sulfate	6.4	5.5	.	.	.	.	2 J	<	<	6.6
Charge Balance Error (%)	-2.3	-5.8	.	.	.	.	-6.4	-4.4	-4.9	-2.7
Trace Metals (mg/L)										
Aluminum	<	<	.	.	.	.	<	<	<	<
Antimonony	<	<	.	.	.	.	<	<	<	<
Arsenic	<	<	.	.	.	.	<	<	<	<
Barium	0.0172	0.0147	.	.	.	.	0.011	0.01	<	0.01
Boron	<	<	.	.	.	.	<	<	<	<
Chromium	<	<	.	.	.	.	<	<	<	<
Copper	<	<	.	.	.	.	<	<	<	0.095
Iron	<	<	.	.	.	.	<	<	0.53	<
Lead	<	<	.	.	.	.	<	<	<	<
Lithium	<	<	.	.	.	.	.	.	.	.
Manganese	<	<	.	.	.	.	<	<	<	<
Nickel	<	<	.	.	.	.	0.22	0.1	0.074	0.23
Selenium	<	<	.	.	.	.	<	<	<	<
Strontium	0.0242	0.0221	.	.	.	.	0.018	0.015	0.014	0.02
Uranium	<	<	.	.	.	.	<	<	.	<
Zinc	<	<	.	.	.	.	<	<	<	0.058

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-521		GW-522			GW-540		GW-542	
Functional Area	LIV		LIV			LII		CDLVI	
Date Sampled	01/10/07	07/12/07	01/10/07	07/12/07		01/18/07	07/18/07	01/17/07	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type					Dup				Dup
Field Measurements									
Time Sampled	10:55	11:30	13:50	10:00	.	13:50	9:45	10:20	.
Measuring Point Elev. (ft)	1,182.88	1,182.88	1,175.48	1,175.48	.	1,072.31	1,072.31	1,051.81	.
Depth to Water (ft)	87.33	88.29	99.70	109.48	.	86.27	87.97	70.52	.
Groundwater Elevation (ft)	1,095.55	1,094.59	1,075.78	1,066.00	.	986.04	984.34	981.29	.
Conductivity (μmho/cm)	367	674	467	750	.	585	926	154	.
Dissolved Oxygen (ppm)	6.01	6.15	7.83	13.19	.	5.31	1.2	7.13	.
Oxidation/Reduction (mV)	165	80	175	89	.	185	154	224	.
Temperature (degrees C)	15.1	18.8	15.2	15.6	.	10.9	18.2	12	.
Turbidity (NTU)	4	1	0	2	.	1	2	1	.
pH	8.41	8.03	7.67	7.78	.	7.88	7.91	6.61	.
Miscellaneous Analytes									
Dissolved Solids (mg/L)	110	160	180	180	190	240	240	140	150
Suspended Solids (mg/L)	2 J	<	<	<	<	<	<	<	<
Turbidity (NTU)	3.4	0.98	0.32	0.57	0.64	0.19	0.22	0.87	0.77
Major Ions (mg/L)									
Calcium	26	31	45	33	34	44	40	32	31
Magnesium	22	22	27	21	21	30	27	17	17
Potassium	1.2 J	<	1.2 J	<	<	1.9 J	3	2 J	1.9 J
Sodium	1.9 J	<	0.79 J	<	<	14	21	0.73 J	0.75 J
Bicarbonate	170	170	220	180	180	240	240	140	140
Carbonate	<	<	<	<	<	<	<	<	<
Chloride	1.1 J	<	1.5 J	<	<	1.6 J	<	1.1 J	1.2 J
Fluoride	<	<	<	<	<	<	<	<	<
Nitrate as N	0.22 J	<	0.42 J	<	<	<	<	0.34 J	0.34 J
Sulfate	1.6 J	<	3.2 J	<	<	6.1	6.6	3.4 J	3.5 J
Charge Balance Error (%)	-6	-3.5	-1.7	-5.8	.	1.6	0.3	0	-0.9
Trace Metals (mg/L)									
Aluminum	<	<	<	<	<	<	<	<	<
Antimonony	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<
Barium	0.0086 J	<	0.014	<	<	0.012	0.012	0.016	0.015
Boron	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<
Iron	0.14	<	<	<	<	<	<	<	0.11
Lead	<	<	<	<	<	<	<	<	<
Lithium	.	.	.	.	.	.	.	.	.
Manganese	0.0066 J	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	0.015 J
Selenium	<	<	<	<	<	<	<	<	<
Strontium	0.0092 J	0.011	0.019	0.014	0.014	0.031 J	0.029	0.022	0.021
Uranium	.	.	<	.	.	<	.	<	<
Zinc	<	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-542		GW-543		GW-544		GW-557		GW-560	
Functional Area	CDLVI		CDLVI		CDLVI		LV		CDLVII	
Date Sampled	07/18/07		01/17/07	07/18/07	01/18/07	07/18/07	01/11/07	07/16/07	01/17/07	07/17/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup								
Field Measurements										
Time Sampled	9:45	.	13:20	11:10	10:50	10:20	10:30	13:15	13:20	9:30
Measuring Point Elev. (ft)	1,051.81	.	1,024.01	1,024.01	1,045.19	1,045.19	1,081.36	1,081.36	949.05	949.05
Depth to Water (ft)	72.34	.	63.98	66.10	57.02	58.97	125.28	125.51	51.60	53.76
Groundwater Elevation (ft)	979.47	.	960.03	957.91	988.17	986.22	956.08	955.85	897.45	895.29
Conductivity (μmho/cm)	250	.	278	1007	995	486	352	205	393	644
Dissolved Oxygen (ppm)	4.34	.	7.97	5.15	9.1	5.99	11.12	9.28	8.2	5.28
Oxidation/Reduction (mV)	153	.	168	94	228	169	176	105	265	137
Temperature (degrees C)	17.1	.	11.2	17.8	9.1	19.7	14.6	19.8	14.4	17
Turbidity (NTU)	1	.	1	4	2	1	2	9	1	2
pH	6.96	.	7.13	7.29	7.26	7.4	7.66	7.72	7.53	7.63
Miscellaneous Analytes										
Dissolved Solids (mg/L)	120	130	270	260	500	540	160	180	170	180
Suspended Solids (mg/L)	<	<	<	<	<	<	<	<	<	<
Turbidity (NTU)	0.63	0.3	0.09 J	0.1	0.06 J	0.1	0.33	0.38	0.08 J	0.26
Major Ions (mg/L)										
Calcium	28	27	58	60	97	96	38	38	42	42
Magnesium	14	14	33	33	53	52	21	22	19	18
Potassium	2	2	0.71 J	<	1.9 J	<	1.4 J	<	1.2 J	<
Sodium	<	<	1.7 J	2.2	9.8	11	0.66 J	<	0.71 J	<
Bicarbonate	110	120	260	260	270	280	170	170	170	170
Carbonate	<	<	<	<	<	<	<	<	<	<
Chloride	<	<	1.6 J	<	15	16	1.3 J	<	1.9 J	<
Fluoride	<	<	<	<	<	<	<	<	<	<
Nitrate as N	<	<	0.26 J	<	0.47 J	0.53	0.44 J	<	0.2 J	<
Sulfate	<	<	6.8	7.9	140	160	1.8 J	<	3 J	<
Charge Balance Error (%)	2.6	.	1.3	2.2	4.1	0.3	0.4	1.3	0.5	-0.5
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	<	<	<	<
Antimonony	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.014	0.014	0.01	0.013	0.021	0.022	0.012	0.01	0.24	0.24
Boron	<	<	<	<	0.84	1.1	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	<	<	<	<	<	<	<	<	<	<
Lead	<	<	<	<	<	<	<	<	<	<
Lithium	.	.	.	.	.	.	.	.	.	.
Manganese	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	0.018	0.018	0.033	0.036	0.051 J	0.051	0.018	0.017	0.026	0.025
Uranium	.	.	<	.	<	.	.	.	<	.
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-562		GW-564				GW-612	GW-709	
Functional Area	CDLVII		CDLVII				CRSP	LII	
Date Sampled	01/16/07	07/17/07	01/17/07		07/17/07		05/17/07	01/11/07	07/16/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	BJC	BJC
Sample Type				Dup		Dup			
Field Measurements									
Time Sampled	13:35	10:50	10:30	.	11:00	.	9:55	14:10	10:15
Measuring Point Elev. (ft)	934.69	934.69	938.07	.	938.07	.	1,131.03	906.81	906.81
Depth to Water (ft)	13.87	15.40	12.20	.	12.65	.	123.51	26.41	30.02
Groundwater Elevation (ft)	920.82	919.29	925.87	.	925.42	.	1,007.52	880.40	876.79
Conductivity (μmho/cm)	440	236	304	.	529	.	331	421	218
Dissolved Oxygen (ppm)	6.53	4.63	9.74	.	6.14	.	1.26	3.03	9.18
Oxidation/Reduction (mV)	213	228	214	.	127	.	115	200	200
Temperature (degrees C)	12.2	17.1	14.2	.	16.6	.	17.8	12.6	20.7
Turbidity (NTU)	1	68	1	.	2	.	.	1	5
pH	7.74	7.71	6.68	.	7.06	.	7.43	8.34	8.63
Miscellaneous Analytes									
Dissolved Solids (mg/L)	200	200	150	140	150	140	236	180	190
Suspended Solids (mg/L)	8.8	21	<	<	<	<	3	<	<
Turbidity (NTU)	16	40	1.3	0.95	1	0.78	32.8	0.28	0.24
Major Ions (mg/L)									
Calcium	43	42	32	34	36	35	47.9	31	31
Magnesium	25	24	13	13	12	12	29.5	29	29
Potassium	0.64 J	<	1.3 J	1.3 J	<	<	<	1.5 J	<
Sodium	1.9 J	6.4	1.4 J	1.5 J	<	<	0.614	3.6 J	3.2
Bicarbonate	200	200	120	120	120	120	251	190	170
Carbonate	<	<	<	<	<	<	<	<	<
Chloride	2.7 J	<	2.7 J	2.7 J	3.2	3	1.58	2.7 J	<
Fluoride	<	<	<	<	<	<	<	<	<
Nitrate as N	0.22 J	<	0.46 J	0.46 J	<	<	0.133	<	<
Sulfate	1.5 J	<	10	10	14	14	3.36	9.2	8.3
Charge Balance Error (%)	0.3	0.6	-1.9	-0.1	-0.3	.	-3	-1.5	3.8
Trace Metals (mg/L)									
Aluminum	0.44	2.6	<	<	<	<	<	<	<
Antimonony	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<
Barium	0.012	0.017	0.02	0.021	0.022	0.022	0.017	0.6	0.59
Boron	<	<	<	<	<	<	0.149	<	<
Chromium	<	<	<	<	<	<	<	<	<
Copper	0.027	<	<	<	<	<	<	<	<
Iron	0.56	1.7	<	<	<	<	3.43	<	<
Lead	<	<	<	<	<	<	0.00517	<	<
Lithium	.	.	.	.	.	.	<	.	.
Manganese	0.01	0.032	<	<	<	<	0.142	<	<
Nickel	<	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<
Strontium	0.022	0.027	0.049	0.051	0.067	0.066	0.0265	0.045	0.044
Uranium	.	.	<	<	.	.	<	<	.
Zinc	<	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-731	GW-732	GW-757		GW-796		GW-797		GW-798	
Functional Area	CRSDB	CRSDB	LII		LV		LV		CDLVII	
Date Sampled	01/09/07	01/09/07	01/11/07	07/16/07	01/16/07	07/16/07	01/11/07	07/17/07	01/16/07	07/17/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type										
Field Measurements										
Time Sampled	9:45	13:40	13:30	11:00	13:05	13:15	14:15	10:35	10:15	13:55
Measuring Point Elev. (ft)	1,049.38	1,064.29	961.64	961.64	1,052.62	1,052.62	1,060.00	1,060.00	1,006.00	1,006.00
Depth to Water (ft)	125.20	157.63	82.55	85.09	84.92	85.11	76.52	78.57	84.95	86.83
Groundwater Elevation (ft)	924.18	906.66	879.09	876.55	967.70	967.51	983.48	981.43	921.05	919.17
Conductivity (μmho/cm)	269	369	622	353	136	245	283	547	299	313
Dissolved Oxygen (ppm)	5.75	6.88	2.46	0.85	6.99	6.85	8.05	4.85	8.5	4.65
Oxidation/Reduction (mV)	197	161	109	117	167	78	145	115	159	31
Temperature (degrees C)	11	14.2	13.1	16.9	13.3	17.8	12.6	19.9	15.6	18.1
Turbidity (NTU)	17	1	1	0	7	5	1	0	1	1
pH	8.3	7.62	10.52	10.26	8.11	8.43	7.67	7.72	7.73	7.85
Miscellaneous Analytes										
Dissolved Solids (mg/L)	159	164	150	160	120	130	300	310	140	150
Suspended Solids (mg/L)	12	<	<	<	4	<	<	<	<	<
Turbidity (NTU)	.	.	0.15	<	5	4.2	0.1	<	0.13	<
Major Ions (mg/L)										
Calcium	27.4	35	2.6	2.3	27	27	57	55	29	30
Magnesium	16.1	21.1	1.8	1.7	16	16	32	31	16	17
Potassium	1.78	1.36	20	18	1.2 J	<	1.7 J	<	1.3 J	<
Sodium	0.94	0.572	46	48	0.62 J	<	5.5	4.9	0.39 J	<
Bicarbonate	.	.	35	47	120	120	200	200	130	140
Carbonate	.	.	76	60	<	<	<	<	<	<
Chloride	.	.	2.3 J	<	1.6 J	<	7.5	7.3	1.9 J	<
Fluoride	.	.	1.5	1.6	<	<	<	<	<	<
Nitrate as N	.	.	0.3 J	<	0.086 J	<	2.5	2.7	0.68	0.65
Sulfate	.	.	17	17	<	<	53	53	2.3 J	<
Charge Balance Error (%)	.	.	-4.8	-1.3	0.3	0.9	1	-0.6	-1.5	-2
Trace Metals (mg/L)										
Aluminum	0.695	<	<	<	<	<	<	<	<	<
Antimonony	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.0107	0.0107	0.057	0.05	0.0083 J	<	0.012	0.011	0.0099 J	<
Boron	<	<	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	0.651	<	<	<	0.21	0.11	<	<	<	<
Lead	<	<	<	<	<	<	<	<	<	<
Lithium	<	<	.	.	.	.	.	.	.	.
Manganese	0.0194	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	0.0252	0.016	0.13	0.11	0.014	0.013	0.036	0.032	0.016	0.017
Uranium	<	<	<	.	.	.	<	.	<	.
Zinc	<	<	0.064	<	<	<	<	<	<	<

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-799		GW-801		GW-827		GW-831	
Functional Area	LV		LV		CDLVI		FCAP	
Date Sampled	01/16/07	07/17/07	01/11/07	07/16/07	01/17/07	07/18/07	01/09/07	07/11/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								
Field Measurements								
Time Sampled	11:00	9:15	10:45	13:15	14:35	13:35	9:55	14:25
Measuring Point Elev. (ft)	981.29	981.29	1,097.16	1,097.16	1,051.60	1,051.60	1,091.29	1,091.29
Depth to Water (ft)	22.68	25.15	117.31	119.72	45.72	45.65	131.55	132.13
Groundwater Elevation (ft)	958.61	956.14	979.85	977.44	1,005.88	1,005.95	959.74	959.16
Conductivity (μmho/cm)	165	163	181	626	176	341	205	626
Dissolved Oxygen (ppm)	4.98	5.34	11.1	7.52	5.7	2.68	7.45	7.26
Oxidation/Reduction (mV)	187	173	186	75	107	123	206	84
Temperature (degrees C)	11.7	17.8	9.1	17.6	13.1	17.1	7.6	19.7
Turbidity (NTU)	2	20	2	5	1	1	1	2
pH	8.09	8.46	7.39	7.85	7.61	7.98	8.21	8.26
Miscellaneous Analytes								
Dissolved Solids (mg/L)	150	150	150	160	160	150	.	.
Suspended Solids (mg/L)	<	<	1.6 J	<	<	<	.	.
Turbidity (NTU)	1.4	0.36	0.97	0.28	0.18	0.1	.	.
Major Ions (mg/L)								
Calcium	33	31	34	32	34	33	.	.
Magnesium	18	16	19	18	20	19	.	.
Potassium	0.97 J	<	0.56 J	<	1.3 J	<	.	.
Sodium	0.52 J	<	0.65 J	<	0.64 J	<	.	.
Bicarbonate	150	140	150	150	160	150	.	.
Carbonate	1.3 J	<	<	<	<	<	.	.
Chloride	2.1 J	<	1.2 J	<	0.72 J	<	.	.
Fluoride	0.061 J	<	<	<	<	<	.	.
Nitrate as N	1.1	1.1	0.13 J	<	0.091 J	<	.	.
Sulfate	2.3 J	<	2.5 J	<	1.2 J	<	.	.
Charge Balance Error (%)	-0.6	-3.1	0.9	-2	0	0	.	.
Trace Metals (mg/L)								
Aluminum	<	<	<	<	<	<	.	.
Antimonony	<	<	<	<	<	<	.	.
Arsenic	<	<	<	<	<	<	.	.
Barium	0.0061 J	<	<	<	0.0076 J	<	.	.
Boron	<	<	<	<	<	<	.	.
Chromium	0.032	0.04	<	<	<	<	.	.
Copper	<	<	<	<	<	<	.	.
Iron	<	<	<	<	<	<	.	.
Lead	<	<	<	<	<	<	.	.
Lithium	.	.	.	.	.	.	.	.
Manganese	<	<	<	<	<	<	.	.
Nickel	<	<	<	<	<	<	.	.
Selenium	<	<	<	<	<	<	.	.
Strontium	0.02	0.019	0.018	0.016	0.018	0.018	.	.
Uranium	.	.	.	.	<	.	.	.
Zinc	<	<	<	<	<	<	.	.

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	MCK 2.0		MCK 2.05				S17		SCR1.25SP	
Functional Area	EXP-SW		EXP-SW				EXP-SW		EXP-SW	
Date Sampled	01/23/07	07/17/07	01/23/07		07/17/07		05/02/07		01/23/07	07/17/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP	BJC	BJC
Sample Type				Dup		Dup		Dup		
Field Measurements										
Time Sampled	14:25	8:45	14:15	14:15	8:30	8:30	10:15	10:15	9:50	10:05
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.	.	.	.
Conductivity (μmho/cm)	411	339	406	.	371	.	316	316	224	315
Dissolved Oxygen (ppm)	12.66	9.65	4.54	.	3.37	.	5.46	5.46	13.63	10.71
Oxidation/Reduction (mV)	40.4	40.3	53.1	.	10.9	.	153	153	140.6	88.6
Temperature (degrees C)	10.54	17.24	11.64	.	17.05	.	16.6	16.6	10.17	17.28
Turbidity (NTU)	2.74	5.67	4.47	.	5.87	.	.	.	3.9	8.09
pH	6.55	7.48	6.28	.	6.81	.	7.87	7.87	6.22	7.45
Miscellaneous Analytes										
Dissolved Solids (mg/L)	221	233	191	179	246	207	164	162	151	189
Suspended Solids (mg/L)	6	11	7	<	<	<	2	2	11.6	<
Turbidity (NTU)	.	.	.	.	.	.	1.73	1.67	.	.
Major Ions (mg/L)										
Calcium	35.7	45.5	45.6	45.5	42.5	39.9	38.4	38.9	40.3	38.3
Magnesium	10.1	15.4	15.9	15.8	15.8	15	15.6	15.9	14.3	16.6
Potassium	4.59	4.24	4.37	4.37	4.08	3.77	<	<	1.03	0.949
Sodium	1.49	1.74	1.7	1.68	1.67	1.51	0.83	0.827	1.66	0.997
Bicarbonate	106	172	158	152	164	168	152	151	83.2	172
Carbonate	<	<	<	<	<	<	<	<	<	<
Chloride	1.8	1.7	1.9	2	2.6	1.7	1.46	1.45	2.1	2.2
Fluoride	0.12	0.12	0.11	0.12	0.12	0.11	<	<	<	<
Nitrate as N	.	.	.	.	.	.	1.9	1.89	0.16	0.14
Sulfate	27.8	20.6	20.8	20.7	16.7	18	4.9	4.93	9.5	4.9
Charge Balance Error (%)	0	-3.1	1.1	2.5	-2	.	-1.2	-0.2	24.9 R	-4.5
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	<	<	0.289	<
Antimonony	<	<	<	.	<	<	<	<	<	<
Arsenic	0.0107	0.0161	0.0576	0.0647	0.0716	0.0661	<	<	<	<
Barium	0.055	0.0768	0.0895	0.0897	0.0988	0.0932	0.0548	0.0562	0.0476	0.0706
Boron	0.154	0.197	0.202	0.204	0.194	0.183	<	<	<	<
Chromium	<	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<	<
Iron	0.106	0.549	1.88	2.34	2.18	2.04	0.0522	<	0.397	0.72
Lead	<	<	<	.	<	<	<	<	<	<
Lithium	0.0517	0.0677	0.0616	0.0623	0.0618	0.0581	<	<	<	<
Manganese	0.088	0.243	1.09	1.08	1.3	1.24	0.0103	0.0107	0.0283	0.058
Nickel	<	<	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<	<	<
Strontium	0.593	0.886	0.752	0.745	0.806	0.76	0.0467	0.0476	0.0492	0.0485
Uranium	<	<	<	<	<	<	0.00073	0.00071	<	<
Zinc	<	<	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	SCR1.5SW	SCR2.1SP	SCR2.2SP	SCR3.5SP		SCR3.5SW	SCR4.3SP	
Functional Area	EXP-SW	EXP-SW	EXP-SW	EXP-SW		EXP-SW	EXP-SW	
Date Sampled	05/02/07	05/02/07	05/02/07	01/23/07	07/17/07	05/02/07	01/16/07	07/17/07
Program	GWPP	GWPP	GWPP	BJC	BJC	GWPP	BJC	BJC
Sample Type								
Field Measurements								
Time Sampled	9:10	10:45	9:25	8:40	9:10	9:35	13:45	12:45
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.	.
Conductivity (μmho/cm)	297	402	355	366	334	350	360	199
Dissolved Oxygen (ppm)	6.71	5.32	4.98	14.85	9.94	5.85	10.65	5.68
Oxidation/Reduction (mV)	165	154	157	190	77.3	167	144	147
Temperature (degrees C)	14.9	16.8	14.1	9.28	18.34	14.9	10.1	17.7
Turbidity (NTU)	.	.	.	5.61	2.72	.	49	14
pH	7.17	7.21	7.34	6.01	7.86	7.74	8.12	7.54
Miscellaneous Analytes								
Dissolved Solids (mg/L)	154	192	189	147	207	191	170	190
Suspended Solids (mg/L)	1	4	3	<	6	1	21	<
Turbidity (NTU)	2.29	1.2	1.89	.	.	1.16	45	13
Major Ions (mg/L)								
Calcium	35.3	47.3	52.3	41.7	46.2	46.3	34	43
Magnesium	14.1	20.3	11.9	12	16	14.7	9.8	14
Potassium	<	<	<	1.92	2.12	<	1.8 J	2
Sodium	1.08	1.19	1.67	1.04	1.24	1.19	1.6 J	<
Bicarbonate	147	195	173	134	180	171	99	150
Carbonate	<	<	<	<	<	<	<	<
Chloride	1.75	1.63	2.11	1.7	1.8	1.29	5.9	3.1
Fluoride	<	<	<	0.11	0.14	0.116	0.077 J	<
Nitrate as N	0.0678	0.194	0.915	0.43	0.15	0.221	0.63	0.87
Sulfate	5.71	5.58	7.46	13.8	10.5	12.3	22	26
Charge Balance Error (%)	-2.3	0.1	-1	1.2	-2.6	-2.2	-2.5	-5.2
Trace Metals (mg/L)								
Aluminum	<	0.218	<	<	<	<	1.1	0.48
Antimony	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	0.00533	<	<
Barium	0.0463	0.0442	0.0339	0.0709	0.0898	0.078	0.078	0.13
Boron	<	<	<	<	<	<	<	<
Chromium	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<
Iron	0.0507	0.247	0.102	0.213	0.559	0.0735	1.3	0.31
Lead	<	<	0.00062	<	<	0.0015	<	<
Lithium	<	<	<	0.0153	0.0221	0.0171	.	.
Manganese	<	0.00969	0.0166	0.0288	0.0732	0.023	0.019	<
Nickel	<	<	<	<	<	<	<	<
Selenium	<	<	<	<	<	<	<	<
Strontium	0.0438	0.0537	0.0667	0.234	0.341	0.277	0.095	0.11
Uranium	0.000805	0.0021	0.00063	<	<	<	.	.
Zinc	<	<	<	<	<	<	<	<

APPENDIX F.2

VOLATILE ORGANIC COMPOUNDS

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-141		GW-143	GW-144	GW-145	GW-161		GW-174	GW-176
Functional Area	**LIV**		**KHQ**	**KHQ**	**KHQ**	**ECRWP**		**CRSP**	**CRSP**
Date Sampled	**01/11/07**	**07/16/07**	**01/08/07**	**01/04/07**	**01/08/07**	**01/25/07**	**07/10/07**	**05/15/07**	**05/17/07**
Program	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**GWPP**	**GWPP**
Sample Type									
Chloroethenes (μg/L)									
Tetrachloroethene	<	<	<	<	<	<	<	4 J	3 J
Trichloroethene	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	23
Chloroethanes (μg/L)									
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	15
1,1-Dichloroethane	<	<	<	<	<	<	<	<	51
Chloromethanes (μg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<
Miscellaneous (μg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	6	<
Trichlorofluoromethane	<	<	.	.	.	.	.	7	<
Dibromochloromethane	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-177		GW-179	GW-180		GW-217		GW-231	
Functional Area	**CRSP**		**CRSP**	**CRSP**		**LIV**		**KHQ**	
Date Sampled	**01/09/07**	**07/11/07**	**05/21/07**	**05/16/07**		**01/10/07**	**07/12/07**	**01/04/07**	
Program	**BJC**	**BJC**	**GWPP**	**GWPP**	**GWPP**	**BJC**	**BJC**	**BJC**	**BJC**
Sample Type					**Dup**				**Dup**
Chloroethenes (µg/L)									
Tetrachloroethene	<	<	1 J	18	18	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	5	6	18	<	<	<	<	<	<
Chloroethanes (µg/L)									
1,1,1-Trichloroethane	8	7	11	<	<	<	<	<	<
1,1-Dichloroethane	26	25	31	<	<	<	<	<	<
Chloromethanes (µg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	<	4 J	4 J	.	.	.	.
Trichlorofluoromethane	.	.	5	4 J	4 J	<	<	.	.
Dibromochloromethane	<	<	<	<	<	<	0.19 J	<	<
Acetone	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-292		GW-293				GW-294	
Functional Area	ECRWP		ECRWP				ECRWP	
Date Sampled	01/23/07	07/10/07	01/24/07		07/10/07		01/22/07	07/11/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type				Dup		Dup		
Chloroethenes (µg/L)								
Tetrachloroethene	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)								
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)								
Carbon tetrachloride	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)								
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.
Trichlorofluoromethane	.	.	.	.	.	.	.	.
Dibromochloromethane	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	2 J	<	<
Bromoform	<	<	<	<	<	<	<	<

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-296		GW-298		GW-301			
Functional Area	ECRWP		ECRWP		CRBAWP			
Date Sampled	01/22/07	07/10/07	01/29/07	07/09/07	01/09/07		07/12/07	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type						Dup		Dup
Chloroethenes (μg/L)								
Tetrachloroethene	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<
Chloroethanes (μg/L)								
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<
Chloromethanes (μg/L)								
Carbon tetrachloride	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<
Miscellaneous (μg/L)								
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.
Trichlorofluoromethane	.	.	.	.	.	.	.	.
Dibromochloromethane	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-305				GW-521		GW-522		
Functional Area	LIV				LIV		LIV		
Date Sampled	01/10/07	04/30/07	07/12/07	10/31/07	01/10/07	07/12/07	01/10/07	07/12/07	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type									Dup
Chloroethenes (μg/L)									
Tetrachloroethene	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	9.3	6.1	6.4	4 J	<	<	<	<	<
Chloroethanes (μg/L)									
1,1,1-Trichloroethane	19	14	14	14	<	<	<	<	<
1,1-Dichloroethane	31	26	24	26	<	<	<	<	<
Chloromethanes (μg/L)									
Carbon tetrachloride	2.6 J	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<
Miscellaneous (μg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.	.
Trichlorofluoromethane	<	<	<	<	<	<	<	<	<
Dibromochloromethane	<	<	0.18 J	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-540		GW-542				GW-543	
Functional Area	LII		CDLVI				CDLVI	
Date Sampled	01/18/07	07/18/07	01/17/07		07/18/07		01/17/07	07/18/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type				Dup		Dup		
Chloroethenes (µg/L)								
Tetrachloroethene	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)								
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)								
Carbon tetrachloride	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)								
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.
Trichlorofluoromethane	<	<	<	<	<	<	<	<
Dibromochloromethane	<	<	<	<	<	<	<	<
Acetone	<	.	<	<	.	.	<	.
Bromoform	<	<	<	<	<	<	<	<

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-544		GW-557		GW-560		GW-562	
Functional Area	**CDLVI**		**LV**		**CDLVII**		**CDLVII**	
Date Sampled	**01/18/07**	**07/18/07**	**01/11/07**	**07/16/07**	**01/17/07**	**07/17/07**	**01/16/07**	**07/17/07**
Program	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**	**BJC**
Sample Type								
Chloroethenes (μg/L)								
Tetrachloroethene	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<
Chloroethanes (μg/L)								
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<
Chloromethanes (μg/L)								
Carbon tetrachloride	<	<	<	<	<	<	<	<
Chloroform	3.1	2.6 J	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<
Miscellaneous (μg/L)								
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.
Trichlorofluoromethane	<	<	<	<	<	<	<	<
Dibromochloromethane	<	<	<	<	<	<	<	<
Acetone	<	.	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-564				GW-612	GW-709		GW-757	
Functional Area	CDLVII				CRSP	LII		LII	LII
Date Sampled	01/17/07		07/17/07		05/17/07	01/11/07	07/16/07	01/11/07	07/16/07
Program	BJC	BJC	BJC	BJC	GWPP	BJC	BJC	BJC	BJC
Sample Type		Dup		Dup					
Chloroethenes (µg/L)									
Tetrachloroethene	<	<	<	<	2 J	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	26	<	<	<	<
Chloroethanes (µg/L)									
1,1,1-Trichloroethane	<	<	<	<	12	<	<	<	<
1,1-Dichloroethane	<	<	<	<	43	<	<	<	<
Chloromethanes (µg/L)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)									
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	<	.	.	.	.
Trichlorofluoromethane	<	<	<	<	<	<	<	<	<
Dibromochloromethane	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-796		GW-797		GW-798		GW-799	
Functional Area	LV		LV		CDLVII		LV	
Date Sampled	01/16/07	07/16/07	01/11/07	07/17/07	01/16/07	07/17/07	01/16/07	07/17/07
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								
Chloroethenes (µg/L)								
Tetrachloroethene	<	<	<	<	5.5	3.4 J	<	<
Trichloroethene	<	<	<	<	0.44 J	0.39 J	<	<
cis-1,2-Dichloroethene	<	<	<	<	4	4.3 J	<	<
1,1-Dichloroethene	<	0.16 J	<	<	2.9	1.6 J	<	<
Chloroethanes (µg/L)								
1,1,1-Trichloroethane	0.5 J	0.31 J	<	<	1.5	0.98 J	<	<
1,1-Dichloroethane	0.32 J	0.31 J	<	<	2	1.6 J	<	<
Chloromethanes (µg/L)								
Carbon tetrachloride	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)								
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	.	.
Trichlorofluoromethane	<	<	<	<	12	2.6 J	<	<
Dibromochloromethane	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-801		GW-827		GW-831		S17	
Functional Area	LV		CDLVI		FCAP		EXP-SW	
Date Sampled	01/11/07	07/16/07	01/17/07	07/18/07	01/09/07	07/11/07	05/02/07	
Program	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP
Sample Type								Dup
Chloroethenes (µg/L)								
Tetrachloroethene	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)								
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)								
Carbon tetrachloride	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)								
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	.	.	.	.	<	<
Trichlorofluoromethane	<	<	<	<	.	.	<	<
Dibromochloromethane	<	<	<	<	<	<	<	<
Acetone	<	<	<	.	<	<	<	<
Bromoform	<	<	<	0.27 J	<	<	<	<

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	SCR1.25SP		SCR1.5SW	SCR2.1SP	SCR2.2SP	SCR3.5SP		SCR3.5SW
Functional Area	**EXP-SW**		**EXP-SW**	**EXP-SW**	**EXP-SW**	**EXP-SW**		**EXP-SW**
Date Sampled	**01/23/07**	**07/17/07**	**05/02/07**	**05/02/07**	**05/02/07**	**01/23/07**	**07/17/07**	**05/02/07**
Program	**BJC**	**BJC**	**GWPP**	**GWPP**	**GWPP**	**BJC**	**BJC**	**GWPP**
Sample Type								
Chloroethenes (µg/L)								
Tetrachloroethene	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)								
1,1,1-Trichloroethane	<		<	<	<	<		<
1,1-Dichloroethane	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)								
Carbon tetrachloride	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<
Methylene chloride	2 B J	<	<	<	<	1 B J	<	<
Miscellaneous (µg/L)								
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.	<	<	<	.	.	<
Trichlorofluoromethane	.	.	<	<	<	.	.	<
Dibromochloromethane	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<

APPENDIX F.2: CY 2006 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	SCR4.3SP	
Functional Area	EXP-SW	
Date Sampled	01/16/07	07/17/07
Program	BJC	BJC
Sample Type		
Chloroethenes (µg/L)		
Tetrachloroethene	<	<
Trichloroethene	<	<
cis-1,2-Dichloroethene	<	<
1,1-Dichloroethene	<	<
Chloroethanes (µg/L)		
1,1,1-Trichloroethane	<	<
1,1-Dichloroethane	<	<
Chloromethanes (µg/L)		
Carbon tetrachloride	<	<
Chloroform	<	<
Methylene chloride	<	<
Miscellaneous (µg/L)		
1,1,2-Trichloro-1,2,2-trifluoroethane	.	.
Trichlorofluoromethane	<	<
Dibromochloromethane	<	<
Acetone	<	<
Bromoform	<	<

APPENDIX F.3

RADIOLOGICAL ANALYTES

APPENDIX F.3: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Functional Area	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Result	TPU	MDA	Result	TPU	MDA
1090	UNCS	01/31/07	BJC	<	.	2.13	<	.	3.68
1090	UNCS	07/25/07	BJC	<	.	2.13	<	.	3.74
GW-141	LIV	01/11/07	BJC	<	.	3	<	.	2
GW-141	LIV	07/16/07	BJC	<	.	2.3	<	.	3
GW-143	KHQ	01/08/07	BJC	3.72	1.87	2.26	15.1	3.63	3.94
GW-144	KHQ	01/04/07	BJC	2.47	1.7	2.45	<	.	3.85
GW-145	KHQ	01/08/07	BJC	12.5	3.66	2.22	9.97	2.95	4.04
GW-161	ECRWP	01/25/07	BJC	<	.	2.82	<	.	3.86
GW-161	ECRWP	07/10/07	BJC	<	.	2.19	.	.	.
GW-174	CRSP	05/15/07	GWPP	<	.	1.9	<	.	6.1
GW-176	CRSP	05/17/07	GWPP	<	.	2.8	<	.	6.6
GW-177	CRSP	01/09/07	BJC	<	.	2.62	<	.	3.88
GW-177	CRSP	07/11/07	BJC	2.73	1.56	2.14	<	.	3.67
GW-179	CRSP	05/21/07	GWPP	5.3	3.3	1.8	<	.	7
GW-180	CRSP	05/16/07	GWPP	<	.	2.4	<	.	6.7
GW-180 Dup	CRSP	05/16/07	GWPP	<	.	1.9	<	.	5.6
GW-203	UNCS	01/31/07	BJC	3.35	1.76	2.25	<	.	3.86
GW-203	UNCS	07/25/07	BJC	<	.	2.05	<	.	4.14
GW-205	UNCS	01/31/07	BJC	<	.	2.37	67.1	11.7	3.85
GW-205	UNCS	07/26/07	BJC	<	.	2.28	67.1	11.6	4.03
GW-217	LIV	01/10/07	BJC	<	.	1.5	2.4	1.2	1.8
GW-217	LIV	07/12/07	BJC	<	.	2.3	<	.	2.9
GW-221	UNCS	01/31/07	BJC	<	.	2.8	<	.	3.86
GW-221	UNCS	07/25/07	BJC	<	.	1.52	<	.	3.43
GW-231	KHQ	01/04/07	BJC	<	.	2.4	4.27	2.16	3.98
GW-231 Dup	KHQ	01/04/07	BJC	<	.	2.38	<	.	3.9
GW-292	ECRWP	01/23/07	BJC	<	.	2.6	<	.	4.07
GW-292	ECRWP	07/10/07	BJC	<	.	2.99	.	.	.
GW-293	ECRWP	01/24/07	BJC	<	.	2.47	<	.	3.91
GW-293	ECRWP	07/10/07	BJC	<	.	2.5	.	.	.
GW-293 Dup	ECRWP	01/24/07	BJC	<	.	1.78	<	.	3.86
GW-293 Dup	ECRWP	07/10/07	BJC	<	.	2.51	.	.	.
GW-294	ECRWP	01/22/07	BJC	<	.	2.09	<	.	3.8
GW-294	ECRWP	07/11/07	BJC	<	.	2.53	.	.	.
GW-296	ECRWP	01/22/07	BJC	<	.	2.19	<	.	3.81
GW-296	ECRWP	07/10/07	BJC	<	.	2.07	.	.	.
GW-298	ECRWP	01/29/07	BJC	<	.	2.53	<	.	3.72
GW-298	ECRWP	07/09/07	BJC	2.18	1.5	2.1	.	.	.
GW-305	LIV	01/10/07	BJC	1.5	1.1	1.5	<	.	1.8
GW-305	LIV	04/30/07	BJC	<	.	2	<	.	1.4
GW-305	LIV	07/12/07	BJC	<	.	1.9	<	.	1.9
GW-305	LIV	10/31/07	BJC	<	.	1.8	<	.	1.3
GW-521	LIV	01/10/07	BJC	<	.	1.9	<	.	2.3
GW-521	LIV	07/12/07	BJC	<	.	1.8	<	.	2.2
GW-522	LIV	01/10/07	BJC	<	.	2.2	<	.	2
GW-522	LIV	07/12/07	BJC	<	.	2.2	<	.	3.1
GW-522 Dup	LIV	07/12/07	BJC	<	.	1.9	<	.	2.1
GW-540	LII	01/18/07	BJC	<	.	2.6	1.6	1	1.6
GW-540	LII	07/18/07	BJC	<	.	3.7	<	.	2.1
GW-542	CDLVI	01/17/07	BJC	<	.	2.5	<	.	1.5
GW-542 Dup	CDLVI	01/17/07	BJC	<	.	2.2	<	.	1.3
GW-542	CDLVI	07/18/07	BJC	<	.	2.2	1.54	0.69	1.2
GW-542 Dup	CDLVI	07/18/07	BJC	<	.	2	1.35	0.73	1.3

APPENDIX F.3: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Functional Area	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Result	TPU	MDA	Result	TPU	MDA
GW-543	CDLVI	01/17/07	BJC	<	.	2.9	<	.	2.3
GW-543	CDLVI	07/18/07	BJC	<	.	2.4	<	.	2
GW-544	CDLVI	01/18/07	BJC	<	.	5.6	<	.	2.7
GW-544	CDLVI	07/18/07	BJC	<	.	5.6	<	.	4
GW-557	LV	01/11/07	BJC	<	.	1.4	1.8	1.1	1.8
GW-557	LV	07/16/07	BJC	<	.	1.8	<	.	2.4
GW-560	CDLVII	01/17/07	BJC	<	.	1.8	1.8	0.95	1.4
GW-560	CDLVII	07/17/07	BJC	<	.	1.9	<	.	2.6
GW-562	CDLVII	01/16/07	BJC	<	.	2.5	<	.	1.4
GW-562	CDLVII	07/17/07	BJC	3.3	1.8	2.7	<	.	3.2
GW-564	CDLVII	01/17/07	BJC	<	.	1.5	<	.	1.1
GW-564 Dup	CDLVII	01/17/07	BJC	<	.	1.8	1.59	0.9	1.4
GW-564	CDLVII	07/17/07	BJC	<	.	1.4	<	.	1.9
GW-564 Dup	CDLVII	07/17/07	BJC	<	.	1.4	<	.	1.8
GW-612	CRSP	05/17/07	GWPP	<	.	3	<	.	6.7
GW-709	LII	01/11/07	BJC	2.1	1.2	1.5	3	1.2	1.8
GW-709	LII	07/16/07	BJC	<	.	2.2	<	.	3.1
GW-757	LII	01/11/07	BJC	1.9	1.1	1.3	15	2.2	1.8
GW-757	LII	07/16/07	BJC	1.84	0.97	1.3	15	2.2	1.9
GW-796	LV	01/16/07	BJC	<	.	1.8	<	.	1.3
GW-796	LV	07/16/07	BJC	<	.	1.6	<	.	1.9
GW-797	LV	01/11/07	BJC	<	.	1.9	<	.	2.2
GW-797	LV	07/17/07	BJC	<	.	2.8	<	.	2.9
GW-798	CDLVII	01/16/07	BJC	<	.	1.6	<	.	1.1
GW-798	CDLVII	07/17/07	BJC	<	.	1.7	<	.	1.9
GW-799	LV	01/16/07	BJC	<	.	1.8	<	.	1.2
GW-799	LV	07/17/07	BJC	<	.	1.6	<	.	2
GW-801	LV	01/11/07	BJC	<	.	1.6	<	.	1.7
GW-801	LV	07/16/07	BJC	<	.	2.1	<	.	2.5
GW-827	CDLVI	01/17/07	BJC	<	.	2.4	<	.	1.4
GW-827	CDLVI	07/18/07	BJC	<	.	2.5	<	.	1.4
MCK 2.0	EXP-SW	01/23/07	BJC	<	.	3.18	<	.	4.57
MCK 2.0	EXP-SW	07/17/07	BJC	<	.	1.91	4.21	1.97	3.54
MCK 2.05	EXP-SW	01/23/07	BJC	<	.	2.44	<	.	4.53
MCK 2.05 Dup	EXP-SW	01/23/07	BJC	<	.	2.43	<	.	4.24
MCK 2.05	EXP-SW	07/17/07	BJC	<	.	2.49	4.22	2.05	3.74
MCK 2.05 Dup	EXP-SW	07/17/07	BJC	<	.	2.68	4.93	2.13	3.7
S17	EXP-SW	05/02/07	GWPP	2.9 R	3	2.5	<	.	5.2
S17 Dup	EXP-SW	05/02/07	GWPP	3.8	3.1	1.8	<	.	5.4
SCR1.25SP	EXP-SW	01/23/07	BJC	<	.	2.49	<	.	4.39
SCR1.25SP	EXP-SW	07/17/07	BJC	<	.	2.64	<	.	3.65
SCR1.5SW	EXP-SW	05/02/07	GWPP	<	.	2.1	<	.	5.6
SCR2.1SP	EXP-SW	05/02/07	GWPP	<	.	2.6	<	.	5.2
SCR2.2SP	EXP-SW	05/02/07	GWPP	3.4	3.1	2.3	<	.	6.7
SCR3.5SP	EXP-SW	01/23/07	BJC	<	.	1.96	<	.	4.23
SCR3.5SP	EXP-SW	07/17/07	BJC	<	.	1.86	<	.	3.66
SCR3.5SW	EXP-SW	05/02/07	GWPP	2.7 R	3.1	1.9	24 Q	4.4	5.4
SCR4.3SP	EXP-SW	01/16/07	BJC	<	.	1.6	2.06	0.97	1.4
SCR4.3SP	EXP-SW	07/17/07	BJC	<	.	1.7	2.6	1.2	2.1

APPENDIX F.3: CY 2007 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Radiological Analytes: Isotopic Analyses

Sampling Point	1090						GW-203					
Functional Area	UNCS						UNCS					
Date Sampled	01/31/07			07/25/07			01/31/07			07/25/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	<	.	2.13	<	.	2.13	3.35	1.76	2.25	<	.	2.05
Gross Beta	<	.	3.68	<	.	3.74	<	.	3.86	<	.	4.14
Cesium-137	.	.	.	.	.	.	.	.	.	.	.	.
Cobalt-60	.	.	.	.	.	.	.	.	.	.	.	.
Potassium-40	.	.	.	.	.	.	.	.	.	.	.	.
Strontium-89/90	<	.	0.407	<	.	0.617	<	.	0.437	<	.	0.613
Technetium-99	.	.	.	.	.	.	.	.	.	.	.	.
Uranium-234	<	.	0.6	0.79	0.403	0.399	0.628	0.452	0.544	0.783	0.383	0.255
Uranium-235	<	.	0.474	<	.	0.361	<	.	0.361	<	.	0.339
Uranium-238	<	.	0.543	<	.	0.381	<	.	0.468	<	.	0.255

Sampling Point	GW-205						GW-221					
Functional Area	UNCS						UNCS					
Date Sampled	01/31/07			07/26/07			01/31/07			07/25/07		
Program	BJC			BJC			BJC			BJC		
Sample Type												
Result (pCi/L)	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA	Activity	TPU	MDA
Gross Alpha	<	.	2.37	<	.	2.28	<	.	2.8	<	.	1.52
Gross Beta	67.1	11.7	3.85	67.1	11.6	4.03	<	.	3.86	<	.	3.43
Cesium-137	<	.	10	<	.	8.79	.	.	.	.	.	.
Cobalt-60	<	.	11	<	.	9.08	.	.	.	.	.	.
Potassium-40	<	.	127	201	113	174	.	.	.	.	.	.
Strontium-89/90	<	.	0.433	<	.	0.184	<	.	0.443	<	.	0.518
Technetium-99	<	.	6.76	<	.	7.08	.	.	.	.	.	.
Uranium-234	0.574	0.402	0.305	0.409	0.296	0.138	<	.	0.505	0.544	0.354	0.349
Uranium-235	<	.	0.358	<	.	0.255	<	.	0.332	<	.	0.133
Uranium-238	<	.	0.358	<	.	0.34	<	.	0.434	<	.	0.383

APPENDIX G

CY 2007 QUALITY ASSURANCE/QUALITY CONTROL DATA

EXPLANATION

Sampling Point:

BCK	-	Bear Creek Kilometer
GHK	-	Gum Hollow Branch Kilometer
GW	-	Monitoring Well (also locations beginning with a number; e.g., 53-1A)
NPR	-	North of Pine Ridge near the Scarboro Community (surface water sampling location)
NT	-	Northern Tributary to Bear Creek
S17	-	Surface water station
SCR	-	South Chestnut Ridge (tributary prefix for spring or surface water sampling location)
SS	-	Spring (Bear Creek Regime)
D	-	Field Duplicate Sample

Hydrogeologic Regime:

BC	-	Bear Creek Hydrogeologic Regime
CR	-	Chestnut Ridge Hydrogeologic Regime
EF	-	Upper East Fork Poplar Creek Hydrogeologic Regime

Notes:

Appendix G shows the method (laboratory) blank and trip blank samples associated with each groundwater and surface water sample collected under management of the GWPP during CY 2007. Each method and trip blank was analyzed for volatile organic compounds (VOCs). None of the method blank samples contained VOCs, but acetone or methylene chloride was detected in seven of the trip blank samples. Additionally, acetonitrile was detected, although not requested for analysis, in 21 trip blank samples collected during the third and fourth quarters of CY 2007. Because of the fairly widespread occurrence in blank samples, acetonitrile will be added to standard suite for analysis beginning in CY 2008.

EXPLANATION (continued)

As shown in the table below, VOCs were detected in the trip blank samples associated with several samples collected during August in the Bear Creek Regime and September/October in East Fork Regime.

Sampling Point	Trip Blank Sample No.	Date Collected	Compound	Trip Blank Result (µg/L)	False-Positive Result (µg/L)
BC Regime					
GW-014	A071990013	08/07/07	Methylene chloride	7	.
GW-014 D	A071990013	08/07/07	Methylene chloride	7	.
GW-626	A071990011	08/02/07	Methylene chloride	6	.
GW-627	A071990012	08/06/07	Methylene chloride	8	.
GW-629	A071990012	08/06/07	Methylene chloride	8	.
BCK-04.55	A071990038	08/01/07	Methylene chloride	42	.
BCK-04.55 D	A071990038	08/01/07	Methylene chloride	42	.
NT-01	A071990038	08/01/07	Methylene chloride	42	.
SS-4	A071990038	08/01/07	Methylene chloride	42	.
SS-5	A071990038	08/01/07	Methylene chloride	42	.
EF Regime					
56-1A	A072780024	10/15/07	Acetone	8 J	.
56-6A	A071990060	09/06/07	Acetone	10	20
56-6A D	A071990060	09/06/07	Acetone	10	.
GW-722-06	A071990075	09/13/07	Acetone	10	.
GW-722-26	A071990075	09/13/07	Acetone	10	.
GW-722-30	A071990075	09/13/07	Acetone	10	.
GW-722-32	A071990075	09/13/07	Acetone	10	.
GW-722-32 D	A071990075	09/13/07	Acetone	10	.
Note: D - duplicate sample; J - estimated concentration					

One acetone result was screened as a false positive based on the contamination in the trip blank samples. The blank qualification result for acetone (compared to the acetone result for the groundwater sample) is 10X the concentration in the blank sample.

EXPLANATION (continued)

A field blank sample was collected once during each quarter of CY 2007. As shown in the table below, samples were collected at well GW-246 in the Bear Creek Regime and well GW-220 in the East Fork Regime.

Bear Creek Regime			East Fork Regime		
Sample Number	**Monitoring Well**	**Date Sampled**	**Sample Number**	**Monitoring Well**	**Date Sampled**
A070090009 A071990010	GW-246 GW-246	03/22/07 08/15/07	A071070082 A072780041	GW-220 GW-220	06/04/07 11/20/07

The field blanks were analyzed for VOCs and none of the compounds in the standard suite were detected in the samples. Although not requested for analysis, acetonitrile was detected at an estimated level (2 µg/L) in the field blank sample collected at GW-220 on November 20, 2007.

One equipment rinsate sample was collected during CY 2007 in the East Fork Regime at Westbay well GW-722 (third quarter). The rinsate sample was analyzed for the same analytes as the associated groundwater sample (see Appendix E), but only the analytes shown below were detected (e.g., above reporting limit or minimum detectable activity).

Well/Port	Sample Number	Date Sampled	Analyte	Result	Units
GW-722-17	A071990074	09/18/07	Gross Alpha Gross Beta Acetone Acetonitrile Dissolved Solids	4.3 33 9 5 z 6	pCi/L pCi/L µg/L µg/L mg/L
Note: z - reported but not required or requested for analysis; qualitative result					

APPENDIX G: CY 2007 QUALITY ASSURANCE/QUALITY CONTROL DATA
Correlation with Associated Groundwater and Surface Water Samples

Sampling Point	Hydrogeologic Regime	Date Sampled	Sample Number	Trip Blank Sample Number	Method Blank Sample Number
55-1A	EF	06/11/07	A071070088	A071070100	Q071720044
55-2A	EF	02/20/07	A070090028	A070090056	Q070600241
55-2A	EF	08/23/07	A071990041	A071990055	Q072770111
55-2A	EF	04/12/07	A071000112	.	Q071080032
55-2B	EF	02/20/07	A070090029	A070090056	Q070600241
55-2B	EF	08/23/07	A071990042	A071990055	Q072770111
55-2B	EF	04/11/07	A071000113	.	Q071080032
55-2C	EF	02/20/07	A070090045	A070090056	Q070600241
55-3A	EF	02/21/07	A070090030	A070090039	Q070600241
55-3A	EF	08/22/07	A071990043	A071990054	Q072770111
55-3A	EF	04/11/07	A071000114	.	Q071080032
55-3B	EF	02/21/07	A070090031	A070090039	Q070870177
55-3B	EF	02/21/07	A070090031	A070090039	Q070870189
55-3B	EF	08/22/07	A071990044	A071990054	Q072770111
55-3B	EF	04/12/07	A071000115	.	Q071080032
55-3C	EF	02/21/07	A070090032	A070090039	Q070870177
55-3C	EF	08/27/07	A071990045	A071990056	Q072820056
56-1A	EF	10/15/07	A072780014	A072780024	Q073030127
56-2A	EF	03/01/07	A070090046	A070090057	Q071000061
56-2A	EF	04/11/07	A071000116	.	Q071080032
56-2A D	EF	03/01/07	A070090047	A070090057	Q071000061
56-2B	EF	03/05/07	A070090048	A070090058	Q071000061
56-2B	EF	04/12/07	A071000117	.	Q071080032
56-2C	EF	03/05/07	A070090049	A070090058	Q070870193
56-2C	EF	03/05/07	A070090049	A070090058	Q071000061
56-3A	EF	02/22/07	A070090033	A070090040	Q070870181
56-3A	EF	08/30/07	A071990046	A071990057	Q072820056
56-3A D	EF	02/22/07	A070090034	A070090040	Q070870181
56-3B	EF	02/22/07	A070090035	A070090040	Q070870189
56-3B	EF	09/04/07	A071990047	A071990058	Q072770116
56-3C	EF	02/22/07	A070090036	A070090040	Q070870181
56-3C	EF	09/05/07	A071990048	A071990059	Q072770116
56-4A	EF	02/26/07	A070090037	A070090041	Q070870181
56-4A	EF	09/05/07	A071990049	A071990059	Q072770116
56-6A	EF	02/26/07	A070090038	A070090041	Q070870181
56-6A	EF	09/06/07	A071990051	A071990060	Q072770120
56-6A D	EF	09/06/07	A071990050	A071990060	Q072770120
60-1A	EF	05/30/07	A071070076	A071070085	Q071720019
60-1A	EF	11/19/07	A072780034	A072780043	Q073520292
GW-014	BC	03/26/07	A070090002	A070090014	Q071010224
GW-014	BC	08/07/07	A071990003	A071990013	Q072550180
GW-014 D	BC	08/07/07	A071990004	A071990013	Q072550180
GW-052	BC	02/12/07	A070090021	A070090026	Q070670318
GW-053	BC	02/13/07	A070090022	A070090027	Q070530172
GW-053	BC	02/13/07	A070090022	A070090027	Q070570296
GW-071	BC	03/21/07	A070090003	A070090012	Q071010221
GW-071	BC	08/09/07	A071990005	A071990014	Q072550180
GW-071 D	BC	03/21/07	A070090004	A070090012	Q071010221

APPENDIX G: CY 2007 QUALITY ASSURANCE/QUALITY CONTROL DATA
Correlation with Associated Groundwater and Surface Water Samples

Sampling Point	Hydrogeologic Regime	Date Sampled	Sample Number	Trip Blank Sample Number	Method Blank Sample Number
GW-072	BC	03/21/07	A070090023	A070090012	Q071010221
GW-082	BC	02/07/07	A070090016	A070090024	Q070570296
GW-082	BC	02/07/07	A070090016	A070090024	Q070670318
GW-085	BC	03/22/07	A070090007	A070090013	Q071010224
GW-085	BC	08/15/07	A071990008	A071990016	Q072550184
GW-089	BC	02/12/07	A070090019	A070090026	Q070670318
GW-089 D	BC	02/12/07	A070090020	A070090026	Q070670318
GW-098	BC	04/23/07	A071070000	A071070009	Q071500203
GW-100	BC	05/07/07	A071070015	A071070024	Q071620153
GW-100 D	BC	05/07/07	A071070016	A071070024	Q071620153
GW-101	BC	05/09/07	A071070019	A071070025	Q071620157
GW-105	EF	06/14/07	A071070094	A071070101	Q071900243
GW-106	EF	06/18/07	A071070095	A071070102	Q071900243
GW-109	EF	06/20/07	A071070096	A071070087	Q071990106
GW-122	BC	05/09/07	A071070018	A071070025	Q071620157
GW-127	BC	05/07/07	A071070017	A071070024	Q071620153
GW-153	EF	03/08/07	A070090068	A070090070	Q071000069
GW-174	CR	05/15/07	A071070028	A071070036	Q071620119
GW-176	CR	05/17/07	A071070032	A071070034	Q071650191
GW-179	CR	05/21/07	A071070031	A071070059	Q071650191
GW-180	CR	05/16/07	A071070029	A071070035	Q071620119
GW-180 D	CR	05/16/07	A071070030	A071070035	Q071620119
GW-192	EF	06/11/07	A071070089	A071070100	Q071720044
GW-204	EF	11/13/07	A072780074	A072780081	Q073460000
GW-219	EF	11/28/07	A072780054	A072780062	Q073380131
GW-220	EF	06/04/07	A071070081	A071070086	Q071720040
GW-220	EF	11/20/07	A072780040	A072780044	Q073520280
GW-225	BC	03/20/07	A070090005	A070090011	Q071010217
GW-225	BC	08/13/07	A071990006	A071990015	Q072320037
GW-226	BC	03/20/07	A070090006	A070090011	Q071010217
GW-226	BC	08/13/07	A071990007	A071990015	Q072320037
GW-229	BC	04/23/07	A071070001	A071070009	Q071500203
GW-236	BC	05/03/07	A071070014	A071070023	Q071620153
GW-240	EF	03/08/07	A070090067	A070090070	Q071000069
GW-246	BC	03/22/07	A070090008	A070090013	Q071010224
GW-246	BC	08/15/07	A071990009	A071990016	Q072550184
GW-251	EF	06/25/07	A071070098	A071070104	Q072040209
GW-257	BC	02/08/07	A070090017	A070090025	Q070670318
GW-265	EF	06/05/07	A071070047	A071070056	Q071720040
GW-265	EF	10/17/07	A072780016	A072780026	Q073030127
GW-265 D	EF	06/05/07	A071070048	A071070056	Q071720125
GW-269	EF	06/05/07	A071070049	A071070056	Q071720125
GW-269	EF	10/17/07	A072780017	A072780026	Q073030127
GW-270	EF	06/06/07	A071070091	A071070099	Q071720125
GW-272	EF	03/14/07	A070090050	A070090073	Q071000073
GW-273	EF	06/06/07	A071070090	A071070099	Q071720125
GW-274	EF	03/13/07	A070090051	A070090060	Q071000073
GW-275	EF	03/13/07	A070090052	A070090060	Q071000073

APPENDIX G: CY 2007 QUALITY ASSURANCE/QUALITY CONTROL DATA
Correlation with Associated Groundwater and Surface Water Samples

Sampling Point	Hydrogeologic Regime	Date Sampled	Sample Number	Trip Blank Sample Number	Method Blank Sample Number
GW-277	BC	05/14/07	A071070022	A071070027	Q071620119
GW-289	BC	02/08/07	A070090018	A070090025	Q070670318
GW-307	BC	05/01/07	A071070005	A071070044	Q071340149
GW-313	BC	05/01/07	A071070006	A071070044	Q071340149
GW-313 D	BC	05/01/07	A071070007	A071070044	Q071340149
GW-315	BC	05/01/07	A071070008	A071070044	Q071340149
GW-332	EF	03/06/07	A070090055	A070090059	Q071000065
GW-336	EF	03/06/07	A070090054	A070090059	Q071000065
GW-337	EF	03/06/07	A070090053	A070090059	Q071000065
GW-368	BC	04/26/07	A071070002	A071070011	Q071340149
GW-369	BC	04/30/07	A071070003	A071070012	Q071340149
GW-381	EF	12/04/07	A072780059	A072780066	Q080020079
GW-383	EF	06/20/07	A071070080	A071070087	Q071990106
GW-383	EF	11/19/07	A072780038	A072780043	Q073520292
GW-383 D	EF	11/19/07	A072780039	A072780043	Q073520292
GW-505	EF	06/18/07	A071070093	A071070102	Q071900243
GW-537	BC	05/03/07	A071070013	A071070023	Q071620153
GW-601	BC	04/24/07	A071070004	A071070010	Q071500203
GW-612	CR	05/17/07	A071070033	A071070034	Q071650191
GW-615	BC	05/14/07	A071070021	A071070027	Q071620119
GW-616	BC	05/10/07	A071070020	A071070026	Q071620157
GW-620	EF	06/19/07	A071070097	A071070103	Q071990106
GW-626	BC	03/19/07	A070090000	A070090010	Q071010217
GW-626	BC	08/02/07	A071990000	A071990011	Q072410163
GW-627	BC	03/19/07	A070090001	A070090010	Q071010217
GW-627	BC	08/06/07	A071990001	A071990012	Q072410163
GW-629	BC	01/09/07	A062710000	A062710001	Q070380176
GW-629	BC	08/06/07	A071990002	A071990012	Q072550180
GW-653	BC	02/07/07	A070090015	A070090024	Q070570296
GW-653	BC	02/07/07	A070090015	A070090024	Q070670318
GW-656	EF	11/13/07	A072780075	A072780081	Q073460000
GW-686	EF	06/13/07	A071070051	A071070058	Q071900243
GW-686	EF	10/18/07	A072780019	A072780027	Q073230024
GW-686 D	EF	10/18/07	A072780020	A072780027	Q073230024
GW-690	EF	10/22/07	A072780067	A072780076	Q073230024
GW-691	EF	10/22/07	A072780068	A072780077	Q073230024
GW-692	EF	10/16/07	A072780069	A072780025	Q073030127
GW-694	BC	08/16/07	A071990019	A071990026	Q072550184
GW-694 D	BC	08/16/07	A071990020	A071990026	Q072550184
GW-698	EF	06/13/07	A071070050	A071070058	Q071900243
GW-698	EF	10/16/07	A072780018	A072780025	Q073030127
GW-700	EF	10/25/07	A072780070	A072780078	Q073300000
GW-700 D	EF	10/25/07	A072780071	A072780078	Q073300000
GW-703	BC	08/16/07	A071990021	A071990026	Q072550184
GW-722-06	EF	09/13/07	A071990063	A071990075	Q072890060
GW-722-10	EF	09/17/07	A071990069	A071990076	Q072890060
GW-722-14	EF	09/18/07	A071990072	A071990078	Q072890064
GW-722-17	EF	09/18/07	A071990073	A071990078	Q072890064

APPENDIX G: CY 2007 QUALITY ASSURANCE/QUALITY CONTROL DATA
Correlation with Associated Groundwater and Surface Water Samples

Sampling Point	Hydrogeologic Regime	Date Sampled	Sample Number	Trip Blank Sample Number	Method Blank Sample Number
GW-722-20	EF	09/17/07	A071990071	A071990077	Q072890064
GW-722-22	EF	09/17/07	A071990070	A071990077	Q072890064
GW-722-26	EF	09/13/07	A071990065	A071990075	Q072890060
GW-722-30	EF	09/13/07	A071990064	A071990075	Q072890060
GW-722-32	EF	09/13/07	A071990066	A071990075	Q072890060
GW-722-32 D	EF	09/13/07	A071990067	A071990075	Q072890060
GW-722-33	EF	09/17/07	A071990068	A071990076	Q072890060
GW-724	BC	08/20/07	A071990023	A071990027	Q072610162
GW-725	BC	08/20/07	A071990022	A071990027	Q072550184
GW-735	EF	03/08/07	A070090065	A070090070	Q071000069
GW-735 D	EF	03/08/07	A070090066	A070090070	Q071000069
GW-738	BC	08/21/07	A071990024	A071990028	Q072610162
GW-740	BC	08/21/07	A071990025	A071990028	Q072610162
GW-744	EF	03/15/07	A070090062	A070090071	Q071000073
GW-747	EF	03/15/07	A070090063	A070090071	Q071000073
GW-750	EF	03/07/07	A070090064	A070090069	Q071000065
GW-763	EF	12/03/07	A072780058	A072780065	Q080020079
GW-765	EF	12/03/07	A072780049	A072780065	Q080020079
GW-769	EF	05/29/07	A071070078	A071070084	Q071720019
GW-769	EF	11/13/07	A072780036	A072780081	Q073460000
GW-770	EF	05/29/07	A071070079	A071070084	Q071720019
GW-770	EF	11/12/07	A072780037	A072780080	Q073440125
GW-775	EF	11/29/07	A072780055	A072780064	Q073380131
GW-775 D	EF	11/29/07	A072780056	A072780064	Q073380131
GW-776	EF	11/29/07	A072780057	A072780064	Q073380131
GW-779	EF	02/27/07	A070250195	A070090042	Q070870185
GW-779	EF	09/10/07	A071990052	A071990061	Q072770120
GW-781	EF	11/27/07	A072780051	A072780060	Q073380135
GW-782	EF	11/27/07	A072780052	A072780060	Q073380135
GW-783	EF	11/28/07	A072780053	A072780062	Q073380135
GW-791	EF	11/12/07	A072780072	A072780080	Q073440125
GW-792	EF	11/12/07	A072780073	A072780080	Q073440125
GW-816	EF	03/07/07	A070090061	A070090069	Q071000065
GW-820	EF	05/30/07	A071070077	A071070085	Q071720019
GW-820	EF	11/20/07	A072780035	A072780044	Q073520280
GW-954-1	EF	05/23/07	A071070052	A071070055	Q071720015
GW-954-1	EF	10/30/07	A072780021	A072780028	Q073300004
GW-954-2	EF	05/23/07	A071070053	A071070055	Q071720015
GW-954-2	EF	10/30/07	A072780022	A072780028	Q073300004
GW-954-3	EF	05/23/07	A071070054	A071070055	Q071720015
GW-954-3	EF	10/30/07	A072780023	A072780028	Q073310026
GW-956-1	EF	05/22/07	A071070071	A071070083	Q071510324
GW-956-1	EF	10/29/07	A072780030	A072780042	Q073300004
GW-956-1 D	EF	05/22/07	A071070072	A071070083	Q071510324
GW-956-2	EF	05/22/07	A071070073	A071070083	Q071510324
GW-956-2	EF	10/29/07	A072780031	A072780042	Q073300004
GW-956-3	EF	05/22/07	A071070074	A071070083	Q071510324
GW-956-3	EF	10/29/07	A072780032	A072780042	Q073300004

APPENDIX G: CY 2007 QUALITY ASSURANCE/QUALITY CONTROL DATA
Correlation with Associated Groundwater and Surface Water Samples

Sampling Point	Hydrogeologic Regime	Date Sampled	Sample Number	Trip Blank Sample Number	Method Blank Sample Number
GW-956-4	EF	05/22/07	A071070075	A071070083	Q071510324
GW-956-4	EF	10/29/07	A072780033	A072780042	Q073300004
GW-959	EF	11/20/07	A072780050	A072780044	Q073520280
GW-960	EF	02/28/07	A070250196	A070090043	Q070870185
GW-960	EF	09/10/07	A071990053	A071990061	Q072770120
Surface water and Springs					
BCK-04.55	BC	08/01/07	A071990032	A071990038	Q072410163
BCK-04.55 D	BC	08/01/07	A071990033	A071990038	Q072410163
GHK2.51WSW	EF	11/06/07	A072780086	A072780087	Q073400065
NPR07.0SW	EF	11/06/07	A072780082	A072780087	Q073400065
NPR12.0SW	EF	11/06/07	A072780083	A072780087	Q073400065
NPR12.0SW D	EF	11/06/07	A072780084	A072780087	Q073400065
NPR23.0SW	EF	11/06/07	A072780085	A072780087	Q073400065
NT-01	BC	08/01/07	A071990037	A071990038	Q072410163
S17	CR	05/02/07	A071070041	A071070043	Q071510124
S17 D	CR	05/02/07	A071070042	A071070043	Q071510124
SCR1.5SW	CR	05/02/07	A071070037	A071070043	Q071510124
SCR2.1SP	CR	05/02/07	A071070038	A071070043	Q071510124
SCR2.2SP	CR	05/02/07	A071070039	A071070043	Q071510124
SCR3.5SW	CR	05/02/07	A071070040	A071070043	Q071510124
SS-4	BC	08/01/07	A071990035	A071990038	Q072410163
SS-5	BC	08/01/07	A071990034	A071990038	Q072410163

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